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WITH SUPPLEMENT.

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From "The Times" of Friday, June 3rd, 1927.

the thing he disapproved of.

VIEWS ON PRAYER-BOOK.

At the afternoon session Mr. EGERTON MARTIN (Maidstone), in proposing a resolution welcoming the proposals of the bishops for Prayer-book revision, pleaded for "the same spirit of cooperation" in the Church as was to-day being asked for in industry. It was necessary that some revision should take place because otherwise the disorders in the Church must increase, and also because they wanted a Book which would attract the youth of the day. The revised Book would vastly enrich their services, and it would sanction several illegal, though practically harmless, practices which were at present being carried on in the Church of England.

The REV. H. W. BLACKBURNE, in seconding, said the Book had been received "with howls and yells" and also with deep thankfulness. Those who howled and yelled were, no doubt, disappointed to find that the Book was not half so bad as it might have been

Mr. RUTLEY MOWLL (Dover) could conceive no occasion on which humour was more unbecoming than that. For Mr. Blackburne to talk about the "howls and yells" of people who were simply standing up for the old Prayer-book did not seem to be very edifying. There was nothing to be found in the Scriptures to justify the reservation of the Sacrament, and it was difficult for the layman to understand how the alternative Prayer-book would produce peace. Further, there was no guarantee that the new Book would be more strictly observed than the old.

The REV. BASIL BURROWS and the REV. W. E. DANIELS opposed the resolution, and Mr. A. DAVIES spoke in favour of it.

The REV. E. J. T. STANLEY opposing, said the predecessors of the present Archbishops of Canterbury and York—Archbishops Temple and Maclagan—had declared that reservation had no place in the Church of England. A stone's throw from that building martyrs, including Archbishop Cranmer, were burnt at the stake because they rejected things now to be made legal.

The ARCHBISHOP of CANTERBURY, summing up the discussion, said he deprecated the way in which agitation was being stirred up against the new Prayer-book. After deprecating unseemly methods of controversy, he said he believed if they could bring that Measure through, first the Church Assembly, and then through Parliament, they would do more than anything he could remember to bring about the spirit of loyalty and harmony in the Church and a reverent desire for its progress.

The resolution was carried by 382 votes to 52.

A National Crisis Demands Special and Earnest Prayer.

"Will God Really Respond?"

—(Lavender.)

No. 7, "Will God Really Respond?" of the Series of "14 Little Booklets for Officers and Others," was, some months before the end of the Great War, reprinted *in extenso* on the front page of "The Daily Mail," twice in "The Times," twice in "The Morning Post," once in "The Weekly Times," "The Manchester Guardian," "The Glasgow Herald," and other Scotch and English secular papers, at a cost of hundreds of pounds, resulting, we believe, in much prayer on the part of very many.

Prayer unquestionably won the Great War, vide booklet No. 9, "Lest we forget—Lest we forget" (Brown). May we not pray definitely, unitedly, afresh and anew, that eyes may be opened to see what is right in God's sight, and to do it at all cost, in the great Spiritual War that is now being waged in our midst?

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It is proposed to reprint the above in as many Secular and Religious papers as possible, should there be sufficient finance forthcoming for this special object. All communications may be addressed to "Rozel," 7, Sunnyside, Wimbledon, S.W.19.

ALCOHOL AND THE MOTORIST.

ALCOHOLIC CONCENTRATION IN URINE AS A TEST OF INTOXICATION.*

BY

GODFREY CARTER, M.B.VICT., M.R.C.P.EDIN., D.P.H.LOND.,
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As the use of motor traction has become almost universal, it follows as a natural sequence that measures have become necessary to guard the community against reckless driving, and especially by persons who are under the influence of alcohol. At first sight it would appear that such cases would be few, because the danger, alike to fellow travellers and pedestrians, under these conditions is so serious that elementary instincts of precaution should operate as an overwhelming deterrent.

For a man to drive a fast-running vehicle on a public highway under present crowded conditions whilst drunk is only a degree less culpable than a drunken man being in charge of a railway engine. Disaster is sure to follow.

Since it became part of my official duties to examine all persons arrested on the charge of being intoxicated whilst in charge of motor vehicles within the city boundaries of Sheffield I have been surprised at the number of cases brought to my notice. If I may take our experience, and I think we can, as an average of conditions prevailing elsewhere, I can only affirm that there is throughout the country much undue indulgence by people in charge of cars.

Punishment after conviction should be exemplary. The Government has taken this view, and the Criminal Justice Act, 1925, does not err on the side of leniency. Indeed, many police court practitioners are of opinion that the penalties are so severe that magistrates should hesitate in finding a verdict of guilty, considering that a conviction carries with it a withdrawal of the licence for a considerable period as well as other penalties.

Personally I think the punishment as well as the penalty fits the crime; but I wish that more uniformity existed in the decisions when evidence is of a conclusive character. On one point I think we shall all agree, and that is, that in framing the Act the use of the word "drunk" was unfortunate, and would not have been used had the matter received proper consideration by Parliament. There is no statutory definition of what constitutes being drunk, and therefore all the legal, *versus* medical, wrangling hinges upon the interpretation placed upon the abnormalities presented at the time of arrest and subsequent examination. Had the term "under the influence of alcohol" been used many difficulties would have been avoided and the issue materially simplified. The Central Midwives Board, in framing charges, made this change, and all difficulties have since disappeared. Also the term "under the influence of drink" appears in the Children's Act of 1908, and in the Inebriates Act of 1898, and they are good and workable terms.

Safe motoring depends upon a clear and alert mental outlook. Judgement must be poised, nerve cool, and the brain in a position rapidly to assimilate immediate problems, and arrive at quick and accurate decisions. This delicate nerve balance, poised as it is on the highest brain centres, is the very first function to become disordered by alcohol, and long before the gross inco-ordinations and other symptoms of intoxication develop. Once the latter are in evidence, a person so affected has been running against danger signals for some time, but which his brain has been too dulled to read. In order to satisfy counsel and the magistrates that a man may be unfit to drive a motor vehicle, even when he has more or less successfully run the gamut of the recognized tests, we have to avoid many possible pitfalls.

As a full and detailed pronouncement upon the tests to be applied, and their clinical significance, have been presented for our guidance by the British Medical Association Committee, it would be a waste of time for me to go into that subject again now. We are all more or less familiar with them, but no doubt some of us place a greater or less significance upon certain of the tests than do others, or does the Committee.

Personally I think the association of congested conjunctivae with quickness of the pulse very significant as a positive test for inebriety, and I place less value upon the smell of alcohol in the breath than does the Committee, because it only shows that some alcohol has been consumed, and not how much. Also, when vomiting has occurred, the breath may have only a sour smell replacing the alcoholic odour. Consumption of more than a very small amount, either before or during motoring, is dangerous, and it is only owing to the tolerant way we have come to look upon road problems and dangers that greater resentment has not been aroused.

As I have said, the initial lowering of the mental alertness and obscuration of judgement must always be present when there are demonstrable signs of alcoholic indulgence, and a person showing these signs is unfit to be in charge of a motor vehicle, and therefore "drunk" within the meaning of the Act.

Intoxication is, of course, a matter of degree, and passes by insensible gradations from one step downwards to another. Yet it is only when a man has reached the bottom, in a decidedly mixed-up condition, that counsel or bench will adjudge a man drunk. I am glad that the Association's Committee has placed the loss of power of delicate nerve control from indulgence as its definition of being under the influence of alcohol. It is a sound conclusion, and is on parallel lines with the pronouncement of a County Court judge recently given; he stated that "to satisfy him that drunkenness was present in any given case, the skill and judgement normally required in the manipulation of a motor car had been diminished or impaired as a direct result of the consumption of alcohol. The test, so defined, may be difficult to apply, but drivers should realize that even a slight disturbance of judgement and response, negligible, perhaps, in social moments, may spell tragedy in the hazardous business of handling a car."

Have we any further methods than the tests we customarily use to guide us to a conclusion?

I hope it may be pardonable for me to speak for a few moments upon some work recently carried out by Dr. Southgate at the Sheffield University, and in which I took a modest part. I refer to the alcoholic concentration in urine as a test of intoxication. In its report the British Medical Association Committee says that it is of opinion that, while this work is of great value from a scientific point of view, tests depending upon examination of the urine are not practicable for the purpose now under consideration, owing to the conditions limiting their application.

This limitation no doubt refers to difficulties which arise in obtaining and procuring analyses, but I think these difficulties may be gradually overcome, and are worth applying in such serious cases. An alcoholic secretes a large amount of urine, and does not remain long in a police cell without voiding it. All that is necessary is to make sure that he does not pass it down the w.c. A simple mechanical contrivance can secure this, such as I described in our published communication, and to which I shall make a further reference.

It is obvious that if we can recover alcohol from the urine in estimable quantity by a quick and easily applied method we can at least assert that it has been taken by the mouth within a reasonable time prior to its collection. This disposes of the assertion, made by some on being charged, either that they are total abstainers, or that they have not partaken of more than the usual couple of glasses of beer during the preceding few hours. No textbook with which I am acquainted has given a satisfactory and

* The opening paper of a discussion in the Section of Forensic Medicine at the Annual Meeting of the British Medical Association, Edinburgh, 1927. Owing to the illness of Professor Harvey Littlejohn the chair was taken by the Right Hon. Earl Russell.

expeditious method of performing this analysis, and I would refer those who feel interested in the matter to the paper read by Dr. Southgate and myself before the Medico-Legal Society in London and published in the British Medical Journal on March 13th, 1926.

We owe our present position in this matter chiefly to Mellanby and Southgate. The former has done much work on the estimation of alcohol in the blood, and carried it further to the urine, following upon the lines of Widmark and Miles, and proceeded to establish the ratio between the two. It was found that this ratio stood at the figures 1 to 1.34, showing that the renal epithelium has a selective action for alcohol in secretion. The concentration of alcohol in blood is related to symptoms of intoxication of the central nervous system, and the same applies to urine.

A number of men were experimented upon under arranged conditions, and the following conclusions arrived at. They found that a man of 11 st. weight drinking a solution containing 96 c.cm. of alcohol in one drink passes urine containing 200 c.mm. of alcohol in 100 c.cm. of urine, at its point of maximum concentration. Such a man was moderately intoxicated, and therefore unfit to drive on the road. A concentration of 300 c.mm. per 100 c.cm. of urine suggested quite definite intoxication. The results of many subsequent analyses, together with clinical manifestations in each case, were given, and these fully bore out Mellanby and Southgate's figures. Having obtained a sample of urine it should be quickly bottled to prevent alcoholic evaporation, and once it has reached the analyst a definite result can be obtained within thirty minutes—that is, in time for the opening of the courts. I should add that a Fehling's test should first be performed in order to make sure that there be no alcoholic fermentation from a glycosuric specimen.

I do wish that this examination of the urine for quantitative estimation of alcohol were more frequently applied. If those interested in this subject will study Dr. Southgate's publication they will see the exact conclusion which can be drawn as regards the probable amount of whisky or beer drunk, the time within which the bulk of it had been consumed, and so materially help the court to a correct decision. I may add that as small a quantity as 30 drops of urine will suffice for the purpose of analysis, and the results are given in cubic millimetres per 100 c.cm. of urine.

It is advisable, if possible, to obtain two succeeding specimens, noting the interval of time between their being passed, so as to obtain the inclination of the downward curve. From this we can work backward on the chart, and determine the maximum amount that has been present at the material time preceding the arrest.

A simple device for obtaining the specimens is to clamp a receptacle (which can be easily removed) on to the wooden aperture of the w.c. seat. Another plan is a small porcelain urinal fitted into the cell wall at a convenient height. The waste pipe passes through the wall into an unoccupied cell, and discharges into a vessel placed beneath for its reception. By this method no entry into the man's cell is necessary, and a second specimen is easily obtained. Very few drunken persons, I find, will provide a specimen of urine by request. They usually make an excuse, or pass it on to the floor of the cell when alone or when the ordinary w.c. is not available.

[Dr. Carter exhibited copies of Dr. Southgate's charts and commented upon their significance.]

Discussion.

Dr. E. Bogen (Cincinnati, U.S.A.) referred to the importance of having a quantitative test for drunkenness and described how the alcoholic concentration in the excretions was compared with the findings on clinical examination of 500 persons suspected of drunkenness in the Cincinnati General Hospital. The concentration of alcohol in the breath and urine was tested and compared with the degree of intoxication. The physician was called into court to sustain his evidence. Symptoms of dilated pupils and flushed face were found in less than one-third of these cases, and were principally noted in the moderate groups; persons in a state of coma showed to a high degree constricted pupils and pallor. It was well known that some individuals were able to drink more than others. This was probably due to the delayed absorption of the alcohol and the slower rate of oxidation in persons not habituated. The concentration of alcohol in the breath was the quickest and easiest test. As soon as the disturbing factor of the alcoholic liquor in the mouth was removed the concentration of alcohol in the breath showed a fairly close relation to that in the blood as it passed through the lungs very easily.

Professor J. T. J. Morrison (Birmingham) said the work on the subject of alcohol in the urine was of high scientific value. It proved the possibility of estimating the concentration of alcohol in the blood; and since this gave a clue to the quantity of alcohol imbibed it might rebut the plea that too little had been taken to produce the alleged effects. He did not expect that the urinary test would become generally adopted because of two practical difficulties—the obtaining of specimens, and their prompt analysis. Moreover, further investigation was required to determine the modifying effects of renal and other diseases on the excretion of alcohol. It was also a serious question whether information of this character, acquired without the consent or even the knowledge of a prisoner, would be admissible in all courts as evidence. It was an axiom of British law that no person was bound to furnish evidence that would incriminate him. When, however, an accused person denied the charge and submitted willingly to examination the matter was on a different footing. A drawback to the procedure was the variation in the effects of a given quantity of alcohol in different persons, and even in the same person in varying circumstances. There was a wide discrepancy between a moderate drinker (still more an abstainer) and a toper. Again, in the case of the same person, alcoholic effects varied with the percentage of alcohol, with the rate of consumption, and with the degree of fullness of the stomach. In comparing different persons, the body weight was a material factor; even more influential was the degree of tolerance induced by habit. "Drunk" was so elastic a term that a rigid definition was better avoided; it connoted various mental, emotional, and muscular evidences of disturbance of the central nervous system due to alcohol, and there was no single symptom which might not also be caused by disease or trauma. "Under the influence of alcohol" was too vague a phrase for the court. Any quantity had some influence, and a single glass was taken with that purpose in view. The crucial question was how much evidence of disturbance would show the degree of unfitness to be in charge of a motor car which the court would regard as proof of drunkenness. For legal purposes the impairment of functions must be obvious, and only the composite blending of several groups of findings would convince. To determine whether a person had recently taken alcohol the smell of the breath was a ready test, subject to the well known fallacies. In all cases investigation to ascertain whether the signs and symptoms were due, wholly or partly, to trauma, disease, or malformation was essential. In a medical examination of a man accused of being drunk in charge of a motor car close observation would be made of his general appearance, demeanour, odour of breath, signs of muscular inco-ordination, and time sense relating to the previous few hours. This summary embraced many details relating to face, eyes, and dress; evidences of impaired self-control, loquacity, emotional display of flippancy, anger, or maudlin sentiment, disregard of social conventions, slurring of speech, clumsiness in sitting down and rising, loss of balance in picking up a coin from the floor. It was not uncommon to find that a man who was the worse for drink would be several hours out in his reckoning of the intervals of time between events of the same evening.

Dr. A. Allison (Glasgow) said a person might be held to be drunk for the purpose of one offence but not for the purposes of another. In the present case the question which had to be decided was, Had the fitness or efficiency of the individual to be in charge of a motor car with

safety to himself and the public been diminished by his consumption of alcohol? The decision rested with the court, and it was unnecessary for the medical witness to formulate a definition of drunkenness. It was well known that certain people were affected by quite small quantities of alcohol, and there was no single clinical sign which was characteristic and which could not be simulated by disease. Each individual sign might be easily demolished during cross-examination. The medical examiner should be able to present a complete picture which would convince the judge or jury that the condition of the accused was due to indulgence in alcohol. It was necessary to eliminate symptoms due to disease, shock, or excitement. In Dr. Allison's experience the shock of an accident or arrest was often sufficient to steady the person, at least temporarily. A symptom to which he attached considerable importance was the readiness with which a person who had over-indulged in alcohol fell asleep soon after being placed in the cell. To find a man sleeping heavily ten minutes after the cell door had closed on him was a contraindication of his having suffered from shock or nervousness, and was confirmatory of signs of drunkenness found during the previous examination. It was also helpful in those cases where the man had succeeded temporarily in pulling himself together when first brought to the police station. His practice was to explain the position to the accused and obtain his consent before putting him through any tests for drunkenness. He was also informed of his right to an independent examination by a doctor of his choice. Chemical tests might give useful confirmation, but would never altogether replace clinical evidence.

The CHAIRMAN (Lord Russell) considered the question more from the legal point of view, and discussed the punishment for drunkenness. In a recent debate the motion was passed that the driver's licence should be suspended for twelve months; this was later modified, and the driver was allowed to appeal for the suspension to be removed after three months. With regard to tests for drunkenness, whatever evidence could be produced as to the alcoholic contents of the urine, or any other tests, the general appearance of the accused must also be taken into consideration. He thought the accused should be given an opportunity of having a medical man of his own choice, but that it was not necessary to warn him of the object of the examination.

Professor J. E. W. MACFALL (Liverpool) agreed that Dr. Carter's paper was a valuable scientific contribution, but thought it hardly practicable from a police surgeon's standpoint; he doubted whether the excretions of an accused person could be tested without his full knowledge and consent. As a police surgeon he knew the difficulty of certifying borderline cases. He found that each examiner had his own tests and was able to interpret the results of his tests and form an opinion as to whether the incoordination of thought and action as the result of drinking alcohol interfered with the proper performance of the act involved to such an extent as to produce a condition diagnosable as "drunk." One complication was that the state of the accused was often partly due to alcohol and partly due to excitement. He emphasized the importance of time. On two occasions when examining accused persons and deciding to certify them as "not drunk" he found that after some time both became distinctly incapable of driving efficiently. In one case a man changed from having complete control of himself and became an uproarious inebriate. Of the many tests for muscular co-ordination he found the most delicate was to mount a staircase, when the least want of control was indicated by swaying. Perhaps the best test would be for the examiner to be driven by the accused person.

Dr. CARTER, in reply, said that a man knew why he was arrested and did not need to be warned of the object of the examination, but he agreed that he should be allowed to send for his own doctor. He was glad to know that Dr. Bogen's conclusions tallied with those formed in this country.

RADIOLOGY AND DIAGNOSIS OF INTRATHORACIC TUBERCULOSIS.

THE IMPORTANCE OF RADIOLOGY IN THE DIAGNOSIS OF PULMONARY TUBERCULOSIS.*

BY

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Medical Superintendent, Vale of Clwyd Sanatorium, North Wales.

THE title which has been given me to open this discussion contains two subjects: (1) the importance of radiology in the diagnosis of pulmonary tuberculosis, (2) the importance of this as it affects the specialist and general practitioner. Clearly the first of them has to be dealt with before the second can be considered.

Now the diagnosis of pulmonary tuberculosis is not merely a matter of recognizing the presence of the disease, though the recognition of it and the differential diagnosis are of prime importance, and are often matters of great difficulty. Diagnosis must necessarily include, in addition to the type of disease, the character of it; whether, that is to say, it is acute miliary, acute pneumonic, acute ulcerative, or chronic, and to what extent the changes due to the tubercle bacilli predominate, or are complicated by or overshadowed by those due to the secondary organisms; further, what part is played by the mechanical changes. Thirdly, it is imperative, especially if surgical treatment comes into consideration, to know the anatomical extent of the lesions.

While pulmonary tuberculosis may present itself with all the textbook symptoms and signs, in many cases there are problems as to the extent of the activity, the anatomical areas involved, the character of the secondary changes, and the share they take in the picture, which are extremely difficult to solve. The symptoms and signs vary in every case: the clinical and the radiological picture of any patient are as individualistic as are the whorls, loops, and composites on the thumb which are used for identification purposes. There may be but one symptom, such as lassitude or haemorrhage; there may be no sign other than harsh breath sounds. Symptoms such as cough and sputum may be absent from the picture for years. Pyrexia may be an early or late manifestation. While the symptoms are easy to ascertain but sometimes difficult to interpret, the signs may be difficult in both respects. Some patients seem incapable of using their chest or diaphragm so as to make even the normal breath sounds audible through the stethoscope. When it is remembered, further, that there is practically no symptom and practically no sign that cannot be produced at one time or another by every intrathoracic disease, and that, for example, breath sounds can be heard through even a considerable layer of liquid, it is clear that there must be many cases in which it is essential that every means of ascertaining the trouble must be utilized, and that it is most important in all cases to check, control, and correct the clinical findings by the radiological ones.

Of all methods of investigation the clinical examination is unquestionably the most important, but it does not reveal the whole truth, and for much that is hidden we must turn to radioscopy and radiography. There are some few cases even—and they are chiefly those in which the pleural cavity is the seat of the lesion, or is involved secondarily to the disease in the lung—in which one has to rely on radiology for the main part of the evidence.

Radiology has taught us a very great deal about pulmonary tuberculosis. It has corrected the one-time impression that tuberculosis starts most commonly in the apex of the lung—an impression erroneously formed owing to the conduction of the sounds to this region. It has taught us about the limitations of the movements of the

* A paper read in opening a discussion in the Section of Tuberculosis at the Annual Meeting of the British Medical Association, Edinburgh, 1927. Dr. S. Vere Pearson, President of the Section, was in the chair.

domes of the diaphragm. It has shown us how frequently the disease is more extensive than the clinical findings suggest, and, conversely, how occasionally the disease is much more limited than is suspected, owing to the widespread changes in the physical signs caused by local changes in the larger bronchi. It has also, however, helped for the time to confuse us by showing us the shadows known as "pleural rings," and those changes at the root of the lung which have given birth to the nomenclature of "hilum tuberculosis." It must be remembered that the science of radiology is still young, and that time is needed to interpret all the mysteries which the *x* rays have revealed, and that it is bound to take a long while before the significance of the various shadows can be correlated with the *post-mortem* findings.

The first thing to consider is the importance of radiology in diagnosis and differential diagnosis. The cases that come before us belong to two groups: the one with few symptoms, in which the existence of pulmonary disease has to be determined, and the group with well marked symptoms and signs, in which the character of the disease must be diagnosed. The great majority of the first group consist of children and young adults, and the commonest symptoms are cough, which has persisted since a cold or an acute specific (especially measles and whooping-cough), some lassitude, poor development and dyspnoea; occasionally in the more advanced cases there is cyanosis. The physical signs are usually impaired resistance and resonance, often more on the right than on the left, deficient air entry, and some moist sounds. Quite a number of these cases are labelled hilum (or pulmonary) tuberculosis, some are treated as such, and bear the stigma for the rest of their lives. It is here that radiology has helped at first to confuse us, but will unquestionably, with increasing knowledge, prove of immense benefit.

The great difficulty lies in the inability to establish just when the hilum shadow ceases to be normal, and what are the characteristics of early disease as opposed to chronic irritation. We know that impure atmospheres lead to increase in density of shadows, that chronic irritation causes enlargement of glandular nodes and increased striation, and that in some cases, especially after bronchopneumonia, bronchitis, and also in connexion with chronically enlarged tonsils, these changes may be very striking. Among the considerable number of apparently healthy students I *x*-rayed at University College Hospital sixteen years ago two things struck me in particular—one was the enormous variations that occurred in the so-called normal subject (one only of these has since developed tubercle, and his original radiogram showed nothing striking); the other was that the traction of the heart to the left with a normal-looking lung and pleura was invariably due to a basal pneumonia in the past.

In a recent paper Agassiz draws attention to the clinical picture and the radiological findings in children and young people which are the result of a non-tuberculous fibrosis of the lungs following bronchopneumonia and bronchitis, measles, and whooping-cough. He deprecates, and in my opinion rightly, the readiness with which young people with increase of root shadows and radiations therefrom are labelled "hilum tuberculosis." This term has unfortunately come into general use in much the same way as the words "influenza," "gout," and "rheumatism." It is a label attached indiscriminately, and occasionally correctly. It satisfies the public because it is a definite term which can be repeated to friends and relations; it conceals the need of further investigations, ending often in uncertainty and in vague nomenclature; and it gives a sense of security, as it is as hard to disprove as to confirm. It is a label that once affixed is hard to remove. It is a term which, having been accepted and put into general use, is hard to abolish. Agassiz[1] states that the *x*-ray examination "is of the utmost importance in differentiating fibrosis from other affections of the lung." The following is his description of the *x*-ray findings.

"It is to the shadows at the root and radiating from it that I would direct attention. These may be slightly increased with striations towards the base, or they may be dense, massive shadows extending from the level of the third to the sixth or seventh rib in front with dense striations radiating to the base in particular, and possibly blurring or obscuring the cardio-phrenic angle or angles and accompanied in some cases by some increase of striation towards the upper lobe. All variations between these two extremes may occur. In other cases the normal reticular formation of the lung may be more evident than normal. In others again the shadows, more particularly round the hilum or upper lobe, have a honeycomb appearance, and in yet others star-shaped shadows occur.

"The diaphragmatic outline is frequently irregular, the irregularity taking the form either of undulations or, more often, of peaking. I believe that these irregularities of the diaphragm are due to other causes than that commonly assigned to them, viz., adhesions."

In the majority of the adult cases the patient comes with symptoms of a more pronounced character, and the presence or absence of disease is less likely to be the stumbling-block, but the character of the disease may be. My experience is doubtless not different from that of others. I have had many cases sent to me as suffering from pulmonary tuberculosis who were suffering from some other disease. By far the commonest mistake is bronchiectasis. Some of these patients have gone about for years, despite the persistence of a negative sputum, labelled as pulmonary tuberculosis. In many the clinical diagnosis is easy, but in some it is extremely difficult until it comes to the radiological examination. This in the majority of the cases will settle the diagnosis, but there are some very old-standing cases where the secondary bronchiectatic changes associated with chronic tuberculosis are so predominant that it is hard to differentiate between them and a non-tuberculous bronchiectasis. Less frequent types of mistake have been the labelling of cases of malignant disease and of syphilis as suffering from tuberculosis. One striking feature of these mistakes is that the cases had not been *x*-rayed, and, in most instances, had they been, the error would not have occurred. In this connexion three striking cases may be mentioned, even though tuberculosis did not necessarily enter into the differential diagnosis; in each case the diagnosis was made by the *x* rays only. One was a case of bronchitis and emphysema in which the *x* rays revealed a primary carcinoma of the lung; even when found it was impossible to detect it clinically. Another was a case of diaphragmatic hernia treated in hospitals for thirty years; the nearest guess made was "basal pneumothorax," until radiology cleared up the diagnosis. The third case was an elderly woman with acute pulmonary symptoms, of whose history forty years previously, when she had acute pleurisy and nearly died, I knew nothing. Not until the acute symptoms had subsided and she could be moved for *x*-ray examination did I realize that the lung was shrunken to about one-quarter its original size, and was separated from the shrunken chest wall by inspissated pus.

When we turn to the pleural and mediastinal cases the importance of radiology becomes even greater. We may suspect an interlobar effusion, but it is rarely more than a guess until confirmed by the *x* rays; even greater is the difficulty in cases of mediastinal effusion.

In the diagnosis of activity of a tuberculous lesion it is the clinical signs and not radiology which must be relied on, though unquestionably information can be obtained from the latter source also. The snow-flake fluffy shadow of an acute lesion is in striking contrast to the denser, sharply defined outline of the fibrotic lesion. At times there is a great temptation to diagnose on clinical examination the presence of a cavity when the radiogram shows that the signs are due to a dense area of fibrosis juxtaposed to a large bronchus. Occasionally the radiogram will reveal a cavity in the centre of a densely fibrotic area which is unsuspected from clinical examination; the *x* rays will, moreover, reveal in a large cavity the efficiency or otherwise of drainage of such a cavity, and the retained secretions when present.

When the case under investigation is one with an effusion, or pneumothorax, or a combination of the two, it may be impossible to obtain by clinical examination any idea of the extent of the collapse or the character of the collapsed part of the lung. If on examination a patient is found to have a pleural effusion, it is not sufficient to be content with that as a diagnosis; it is necessary to know the cause of such effusion. It may be failing heart or kidney, trauma, suppuration above or below the diaphragm, an infection, or granuloma inside the pleural

cavity or in the lung. It may be secondary to an inflammatory lesion such as pneumonia, or to carcinoma. It may be primary tuberculosis of the pleura, or secondary to pulmonary tuberculosis. The diagnosis can be easy or extremely difficult, especially if the primary lesion is in a collapsed lung surrounded by liquid. But if the liquid is replaced by air, and the collapsed lung is partially re-expanded, then it becomes possible, not by clinical examination but by radiology, to see the character of the lesion which is primarily responsible.

Information as to the presence of very small effusions; of interlobar effusions; of adhesions, their directions, size, and number; of the nature of the lung in the region of their attachment to it, and of the mediastinal pleural sac cannot be obtained by clinical examination, but is revealed in part or in whole by the *x* rays. Take, for example, the case of a basal pneumonia with imperfect resolution, a pleural effusion, partly absorbed, thickening of the pleura, retraction of the heart, dragging up of the dome of the diaphragm and sinking in of the chest wall—a tuberculous lesion may or may not be present. This complex but common type of case can be diagnosed clinically, but as a general picture only; it is the *x* rays which must contribute the detail and show the relative extent of the various changes. There are two points I would like to call attention to here. I am very sceptical as to the possibility of diagnosing adhesions which exist between an expanded lung and the chest wall; some there are who claim to do this, but I have not as yet had a convincing demonstration. Adhesions between the base of the lung and the diaphragm can, I maintain, be diagnosed if the dome of the muscle is drawn up and distorted; a shrinking lung does not distort the muscle unless adherent to it. This, however, also is a controversial matter. The second point is that thickened parietal pleura is much more easily recognized by clinical examination; in exceptional cases, and naturally when the seat of calcareous deposits, a definite shadow is obtained due to increased obscurity to the *x* rays. As a general rule a density of shadow attributed to thickened pleura can be proved to be due to a thin layer of liquid. The thickened pleura on the lateral surface of a partially collapsed lung can, however, be clearly demonstrated.

Finally, in considering diagnosis, there is the extent of the lesion. It is usually more than is suspected by clinical examination. This is partly due to the fact that while some patients breathe in such a way as to bring the signs into prominence, with others all the sounds are damped and muffled. Moreover, an *x*-ray film shows deep-seated lesions as clearly as superficial ones, and all the shadows are on the one plane.

Two types of case, difficult at times to distinguish clinically, are clearly differentiated with the *x* rays: I refer to patients with deficient expansion, increased resistance, poor air entry, harsh breath sounds, and some prolongation of expiration, with possibly a few moist sounds. This picture may be due to involvement of the larger bronchi at the root, or to scattered small areas of fibrosis throughout the lung substance. I must mention also a particularly interesting case of a patient sent to me with acute laryngeal tuberculosis and the report that both lungs were free of disease. I, too, could find no clinical evidence of any disease, but the *x* rays revealed acute miliary tuberculosis of all five lobes. During the next ten weeks I could detect no signs of the disease which I knew to be there.

Occasionally the clinical and radiological evidence as to dilatation of bronchi and of cavities is inadequate. This is particularly the case in bronchiectasis, and especially for lesions of the left base which are obscured by the cardiac shadow. In these cases the injection of lipiodol into the trachea, and so into the bronchi and bronchioles, may add a wealth of valuable information.

Precision in diagnosis is essential for determining prognosis and treatment; it is absolutely imperative before any surgical treatment can be considered. To attempt treatment of a case of pulmonary tuberculosis by operative intervention without the most thorough radiological (when such is by any means available) as well as clinical examination is to make the patient run serious and unjustifiable risks. In these cases it is not so much the precise condition of the more affected side, but the character and extent of the lesion in the sound lung which is so important. In my examinations I rely entirely on the clinical examination to determine the presence or absence of active disease in the less affected lung, but I turn to radiology for my evidence as to the anatomical extent of the lesion.

The value of a radiogram lies in its clarity and in our power to interpret it. An indifferent radiogram may be not only worthless but a source of danger, as we may fail to detect the existence of lesions of importance, and act on the erroneous idea that they are not present. The radiogram taken with the film on the front of the chest is the most useful standard viewpoint, but it may be advisable to take one with the film on the back, or with the patient in the half-lateral position. In some cases, as in mediastinal effusions, the film must be taken from the front whilst the patient assumes the orthopnoeic position.

I would urge that during the exposure of the film the patient be in the upright rather than the recumbent position. The former is essential when liquid is present. I would also put in a plea that the patient be screened and *x*-rayed sitting down, as standing may prove very exhausting to one who is seedy, and is at the same time possibly undergoing a new experience, and therefore an ordeal.

A patient should be examined with the screen, as this gives a general impression of the lesion, and information as to the lighting up of the various parts of the lungs, and as to the movements of the domes of the diaphragm, and possibly as to the movements of shadows inside the lung. Also a rough idea can be obtained of the relatively anterior or posterior situation of a particular shadow. Screen examinations, unless one waits in the darkened room for about half an hour beforehand, fail to give detail, and it is for this reason, as well as because they afford a permanent record, that radiograms should be taken.

The interpretation of the film brings us to one of the difficult problems. The radiologist who handles hundreds of films and is presumably well up in the literature can detect abnormalities and describe the shadows far better than the average medical man. Unfortunately his opportunities for studying the radiogram and the clinical picture side by side and following the development of the case are limited. The physician who specializes in pleuropulmonary diseases has very great experience, but it is possibly somewhat less than that of the radiologist. He is also less aware of the allowance to be made for imperfect exposure or development, but has the advantage of his knowledge of the clinical side. The general practitioner, with the wide range of knowledge required of him, cannot be expected to have an extensive grasp of the various subtle and complex guises in which pulmonary tuberculosis may manifest itself, nor a thorough understanding for interpretation of radiograms.

He should, therefore, in all obscure cases and in all those in which tuberculosis is suspected, or might be by the patient and relatives, recognize that the first consideration is the welfare of the patient, and that to call in a specialist or consultant and a radiologist is not likely to impair his medical prestige, nor cause the patient to withdraw his confidence. It is possibly partly for fear of this, or of the exposure of his lack of knowledge for the interpretation of radiograms, partly also on account of the expense to the patient, that many general practitioners do not make greater use of the specialists and of radiology on behalf of their patients. Consequently in many cases, because of the indefiniteness of the physical signs or of the difficulty in interpreting them, together with the fear of alarming the patients, the general practitioner prevaricates until the progress of the disease puts all doubt out of court; such delay is, however, a most serious matter, as it increases to a grave degree the time required for treatment, and diminishes greatly the chances of arresting the disease.

It is much to be deplored that many patients apply for sanatorium treatment for the first time only when the disease is so advanced that it is extremely difficult, if possible, to counteract the spread caused during the delay. Frequently the chance of arresting the disease by medical

or surgical means, which possibly did exist six or twelve months previously, has by the time they present themselves been irretrievably lost. The chief causes of delay are:

1. Postponement of treatment by the patient on account of work, finance, or aversion to the idea of entering a sanatorium.

2. Non-realization of the seriousness of the condition due (*a*) to the doctor's opinion (a mistaken one to my way of thinking) that the patient is not equal to facing the situation; (*b*) to the doctor himself not realizing the extent or the seriousness of the disease. In such cases a radiogram with a report on the findings would frequently alter his conception of the case. A true realization of the state of affairs might then save the precious time and money so often wasted through the advice of "a month or two at the seaside," or "a trip to the South of France." The patient starts off without proper knowledge or guidance how he should live, and recuperates sufficiently to drag through an extra few months of work before he is once more laid low by further extension and activity of the disease.

3. Wrong diagnosis owing to an erroneous interpretation of the physical signs. If an invariable rule was made, that when there had been persistence for more than three months of symptoms which might be due to tuberculosis, the sputum (if any) was examined and a radiogram taken, many doctors would find that they retained the confidence of those patients who owing to the lack of these precautions are doomed to a lingering illness, and are often without mercy in their denunciations of the want of thoroughness in the investigation of their case.

REFERENCE.

[1] The Differential Diagnosis of Non-tubercular Fibrosis of the Lungs in Children, *Tubercle*, May, 1927.

DISCUSSION.

Dr. E. RIST (Paris) emphasized the importance of radiological examinations in correcting the clinical findings; he hoped that the time was at hand when a line would no longer be drawn between the physical signs *par excellence* and the radiological findings. *X* rays were invaluable in cases with deep-seated cavity near the hilus, where often no definite focus was discoverable by percussion and auscultation; even quite superficial cavities might be overlooked by relying on ordinary physical signs, and their discovery made an enormous difference to prognosis and treatment. Only by *x*-ray examination had it been established that there could be transmission of abnormal sounds from the diseased to the sound lung, and it alone had given a safe method for deciding on the induction of artificial pneumothorax. In his opinion fluoroscopy was most valuable; it showed, for example, impaired movements, the inspiratory attraction of the whole mediastinum by the fibrotic lung, and the inspiratory distension of the heart shadow in bilateral fibrosis. It should always precede filming, and should be a guide to it as showing the position best adapted to display the particular feature it was desired to study in detail. This would render possible the real use of the film in indicating the minute details in morbid structure, and in obtaining a permanent and indisputable record of the condition at a given date. He pleaded for a further use of the fluoroscope in order to attain correct interpretation of *x*-ray findings; it ought not to be confined to the exceptional and obscure case. The clinician and the *x*-ray specialist ought not to communicate by written reports only; they ought to sit side by side before the fluoroscope, or, better still, the two functions should be combined in the same person. The practitioner should have freer access to the *x*-ray room.

Dr. J. L. STEWART (Manchester) said it could not be too strongly stated that the *x*-ray examination was one item in the clinical examination and did not supersede any part of it. The clinician, not the radiologist, made the diagnosis. He had found radiology of great value in diagnosis, especially in examining contacts, where the earliest definite cases were found, and where very often long-standing quiescent disease was detected by this means in older relatives of active adolescent and juvenile patients. He thought the term "hilum tuberculosis" should be given up. If the disease had reached the lung tissue the case should be classed as pulmonary tuberculosis; if it was confined to the bronchial glands or interlobar pleura, the patients should be labelled accordingly. He believed that with extended experience, basing the diagnosis on clinical and *x*-ray evidence, such classification of cases would be possible. The distinction was of great importance from the point of view of prognosis; thus, it did not follow when the glands or pleura were involved, even extensively, that the prognosis was bad, and careful collection of *x*-ray evidence might aid in revealing the ultimate prospects in such cases. The full value of *x*-ray examination could be appreciated only if it was used as a routine method.

Dr. J. M. WOODBURN MORISON (Edinburgh) said that radiology was only an extension of one of the methods of examination—that of inspection; he should like to see it included under that heading in all textbooks on diagnosis. No physical examination was complete without *x*-ray examination; on the other hand, a radiological diagnosis should never be demanded. The radiologist was seldom a skilled physician, and the clinician rarely had an expert knowledge of radiology; only by the close co-operation of the physician and the radiologist could the full benefit of the *x*-ray examination be obtained. Every young medical practitioner entering the public health service and specializing in tuberculosis should have a full course of instruction in radiology. The speaker then showed some very interesting lantern slides to illustrate the usefulness and limitations of radiology.

Dr. C. P. LAPAGE (Manchester) described an investigation that he and Dr. Bythell had carried out at the Manchester Children's Hospital on hilus tuberculosis. Excluding cases with definite physical signs, he found that the distinction between the catarrhal child and the child with early hilus tuberculosis was very difficult; a septic focus in the tonsils or nose gave toxic symptoms like those of early tuberculosis. He classified cases where possible as catarrhotoxic and tuberculotoxic. Aids in diagnosis were the history of infection, the rate of improvement, temperature and pulse tests, and the tone of the skin—especially that between the scapulae. For the treatment of tuberculotoxic cases he advocated the extension of a convalescent school system. The teaching of such patients was important, both mentally and in its effect on the physical well-being. Patients with hilus shadows who showed also symptoms such as headache, rise of temperature, frequent catarrhal infection, and general loss of tone were, if not actually tuberculous, at least potentially tuberculous. The tubercle bacillus, however it obtained entry, was always at hand to infect the area of chronic inflammation in a debilitated child, whether in a cervical gland or a hilus fibrosis.

Dr. L. D. PARSONS (Ceylon) pleaded for the further use of test doses of old tuberculin as an aid in difficult diagnosis.

Dr. MORRISTON DAVIES said he would add a final word on the difficulties ahead of those who would overstress the radiological examination as compared with the clinical side.

THE INTERRELATION OF PHYSICIAN AND SURGEON IN REGARD TO NON-PULMONARY TUBERCULOSIS.*

BY

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IN these days, when our therapeutics is dominated by the surgical treatment of pulmonary tuberculosis and the conservative treatment of non-pulmonary tuberculosis, the demarcation between the respective spheres of the physician and surgeon seems practically obliterated, and any discussion of their interrelation, therefore, an anachronism,

* A paper introducing a discussion on this subject in the Section of Tuberculosis at the Annual Meeting of the British Medical Association, Edinburgh, 1927.

but closer investigation soon reveals that this fusion of function in non-pulmonary tuberculosis is not nearly so complete as we have a right to expect, and have, in fact, practically achieved on the pulmonary side.

Put briefly, in non-pulmonary tuberculosis, as in pulmonary tuberculosis, the physician and surgeon should be one and the same individual, embodied in the person of the tuberculosis officer or his institutional counterpart, for all purposes of diagnosis and treatment, except those involving major operations or the performance of a few highly technical and specialized procedures.

To attain this end the tuberculosis officer should seize the opportunities that are now available, and train himself to become a competent surgeon, sufficiently well versed in the technique of his specialty to make a good provisional, and hazard an accurate final, diagnosis; to undertake immediate treatment pending admission to an institution; and to shoulder the responsibility for the care of the patient after discharge, giving the general or orthopaedic surgeon his proper status of operator or final court of appeal.

This he can bring about in two ways—first, by looking upon a period of residence in a surgical tuberculosis or orthopaedic hospital as quite as essential a part of his training as residence in a chest hospital or sanatorium; and, secondly, by close linking up of his area surgical work with that of an institution, and based upon it; frequent reciprocal visits and interchange of medical staff being an important part of the scheme.

In this way the conception of pulmonary and non-pulmonary tuberculosis as one and the same disease, of which only the local manifestations vary, would be preserved, and the present tendency to divorce tuberculosis of bones and joints from general tuberculosis, and attach it as a mere appendage to orthopaedics would be checked, a tendency which I am convinced is not in the best interests of the patient.

Tuberculosis, whatever its site, is the same pathological process, diagnosed by the same procedures, and treated on the same principles, and the mere utilization of *methods* of treatment similar to those of orthopaedics should not blind us to the fact that the essential element in the successful management of cases is a sound knowledge of the disease as a whole—knowledge fortified by manual dexterity and reinforced, when required, by the operative skill and expert knowledge of the general or orthopaedic surgeon.

In dealing even with non-pulmonary tuberculosis the practitioner in charge should be first and foremost a physician armed with a surgeon's technique, and not a surgeon "doomed to practise medicine."

There would be very definite advantages if this unification or closer interrelation could be carried out. For example, some much needed precision would be added to our diagnostic criteria, especially in tuberculosis of glands. Our recommendations for treatment would be based on fact rather than on prophecy. Our results, although not so flattering, would make us realize that our former facile cures should have suggested the possibility of reconsidering our diagnoses before we preened ourselves upon our success.

By refraining from making up our minds (although not necessarily withholding treatment) until reasonable probability of the cause amounted to actual or practical certainty we would obviate in a large proportion of cases the mental trauma we inflict so lightly upon our patients to-day, and would avoid the finality of notification with its consequences—those administrative measures which have such serious social and economic results to patients and their dependants.

Let us take, as an instance, tuberculous glands. If the tuberculosis officer or his residential colleague became the surgeon oftener and earlier, and excised doubtful glands for examination, we would clarify our ideas considerably as to the distinction between glands that are tuberculous and glands that are something else, although possibly at the cost of losing our touching faith in the numerous therapeutic fads that exist for the treatment of this condition.

We would realize more keenly that although it is broadly true that a tuberculous lesion is the local manifestation of a general infection, in cervical adenitis both lesion and infection may be localized, accessible, and suitable for eradication, and that eradication is the prerogative of the operating surgeon alone.

It would be for the physician to decide whether the enlarged glands were tuberculous by a rigorous process of exclusion, by removing every contributory cause, by, if necessary, direct examination; it would be for him to decide whether the disease was localized by careful clinical examination, especially of the chest, by determining possibly the type of bacillus present, by radiography of the hilus, and, in doubtful cases, even by prolonged observation of the effects of hygienic measures upon the general condition and weight curve of the patient.

When radical measures had been decided upon, he would choose his surgeon with discrimination, bearing in mind that this operation is difficult, tedious, and unpopular; that too often those who can won't, and those who will can't; that sometimes more vigour than care, more trauma than gentleness, distinguishes the technique, with the undesirable effect of increasing the risks, always present, of general dissemination, of direct spread with its complications, and of nerve injury with its consequences. He would also see that the cause—the primary source of infection in the tonsils and adenoids or teeth—was removed as well as the consequence, the diseased glands themselves.[1]

If the surgeon in his turn remembered his medicine he would not operate in unsuitable cases—those cases in which a pulmonary lesion co-exists, in which the supraclavicular or axillary glands are involved, or in which the disease, although still possibly confined to the lymphatic system, has passed beyond the reach of his knife. He could, however, teach the physician the value of his methods of immobilization in the treatment of pulmonary disease, for example, by the use of a plaster bed, in the treatment of abdominal adenitis by similar means, and in the treatment of glands of the neck by such methods as a plaster fillet. He could point out the object lesson that may be learnt from the benign course run by pulmonary tuberculosis when associated with tubercle elsewhere, due partly, at any rate, to the more complete rest secured by surgical methods.

In "orthopaedic" tuberculosis it must be admitted that the balance of advantage resulting from a closer association of the medical and surgical sides would be with the tuberculosis officer. He would be reassured by soon finding out that in early cases there is as much difficulty on the surgical side in deciding whether there is definite evidence of tuberculosis or not, and if disease is present in stating whether it is active and requires treatment, as there is on the medical side; while the choice and duration of treatment and the differential diagnosis may be even more baffling, although, unfortunately, the price of error which the patient pays is frequently heavier in loss of time, money, and opportunities.

Few problems in medicine require nicer judgement or greater patience than to decide in bone and joint cases when the disease is quiescent and treatment can be altered, or when the disease is arrested and treatment can be discontinued.

In early lung involvement the issue is usually clear-cut—namely, the presence or absence of tuberculosis; in non-pulmonary tuberculosis this issue is complicated by the necessity in addition of differentiating between tuberculosis and a number of conditions which may closely simulate it—conditions which may require treatment, but have a very different prognostic import.

Tuberculosis officers may, therefore, take heart of grace when they are puzzled in arriving at a complete diagnosis with the limited facilities they have at hand. Experts themselves, with all the diagnostic aids of a well equipped institution at their disposal, are sometimes foiled, and have to play for safety, either by assuming the presence of the graver disease, or by contenting themselves with an approximate diagnosis, which only time and observation will more accurately define.

On most occasions, therefore, tuberculosis officers should content themselves with a provisional diagnosis and *act upon it*. Until tuberculosis officers are physicians and surgeons too we must follow the advice so admirably emphasized by Mr. Girdlestone—namely, the sufficiency of a preliminary, provisional, or approximate diagnosis, provided it is followed immediately by such action as

attendance at a clinic or admission to hospital, where the differential diagnosis can be elucidated without detriment to the patient, and where treatment can be initiated without loss of time.[2]

In this respect the interrelation that exists at present between area physicians and tuberculosis surgeons is comparable to that which exists between the area physician and general practitioner, and for the same reason—not necessarily because the one has a specialist knowledge compared with the other (it is hoped that that reproach will soon be removed), but because the surgeon has at his command institutional and other facilities which are essential for prompt diagnosis and treatment.

The benefit of closer co-operation or unification would not, however, be entirely on the physician's side. The surgeon would learn to pay more than lip homage to the truth that tuberculosis is one and indivisible, and that bone and joint disease is a secondary manifestation to primary infection elsewhere. He would act more frequently upon the fact that while coincident clinical tuberculosis of these structures is admittedly uncommon, evidence of hilus involvement or of pulmonary disease can be found oftener than is generally realized, and that to treat the diseased joint only is not the whole, and may not even be the most important part, of the treatment, which should be threefold—directed towards the patient, the occult primary lesion, as well as to the obvious secondary manifestation.

It would be more generally realized that in associated pulmonary and non-pulmonary disease premature success in arresting the local lesion (especially if the former is the primary manifestation) may even activate or reactivate the trouble in the lung.[3] It would be remembered also that, while the development of secondary deformities is a reproach, caution in attempts at preventing or correcting the primary deformity may not be too high a price to pay for life.

The surgeon's association with the tuberculosis officer would enable him to realize more vividly the economic repercussion in adult patients of his occasionally too conservative methods in some lesions of the lower limb. He would also realize that after-care in tuberculosis, as opposed to orthopaedics, is more than a medical problem, and connotes much more than the correct use of appliances; that failure is not necessarily due to indifference or carelessness, but to those social and economic disabilities that exert such a profound effect upon the prognosis of tuberculosis in any form.

In closing, may I express the hope that my colleagues in the tuberculosis service will realize before it is too late the need for proving themselves equal to the new and fascinating demands that are being made upon their adaptability, intelligence, and clinical knowledge.

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[1] Stone: *Boston Med. and Surg. Journal*, March, 1923, p. 275.
[2] Girdlestone: *Diagnosis and Treatment of Tuberculosis of the Hip.*
[3] Keller: *Med. Journ. and Record*, February, 1926, p. 170.

DISCUSSION.

Professor J. FRASER (Edinburgh) agreed as to the necessity and value of co-operation. The present-day principles underlying the successful treatment of non-pulmonary tuberculosis could be summed up as: (1) removing the local infection if reasonably possible; (2) stimulating the general resistance of the patient; (3) putting the affected part at rest; (4) attacking directly the infecting organism—by tuberculins, serums, and drugs; and (5) treating the various symptomatic disturbances. So far as treatment directed towards cure of infection was concerned, drugs had been disappointing; a specific chemo-therapeutic agent had still to be discovered. Hope lay in the further co-operation of the pharmacologist and the clinician, the laboratory and the ward. He had not been able to obtain a reasoned opinion on the real value of tuberculin in its therapeutics, its method of administration, and the technique of its dosage. He did not doubt that this treatment had some value. He was more convinced than ever of the correctness of surgical intervention in the presence of certain definite indications, such as tuberculous disease of some groups of cervical glands. This infection remained for some time a local disease, infected from a local point of lymphatic absorption. There was at present no sure method of arresting the disease by conservative and therapeutic means, and the results of surgical treatment justified this procedure. Rest was the basis of local treatment, and it should be as complete as possible; it encouraged fibrosis, which was nature's method of arresting the tuberculous focus. If the ideal result was to be attained there should be no sudden resumption of function; there the physician and surgeon could usefully co-operate in the constant vigilance of apparently cured cases. He was very sceptical of the success of any scheme for the training of a special type of individual—a physician with a surgeon's training—and preferred the collaboration of a physician interested in tuberculosis as a general disease with local manifestations, and a good general surgeon with orthopaedics as his hobby.

Mr. G. R. GIRDLESTONE (Oxford) thought that in the case of badly deformed patients the criticism should be directed against failure in orthopaedic technique during the period of active disease rather than against any excessive conservatism. The division of potential cripples into tuberculous and non-tuberculous would prove to be neither economical nor efficient. The treatment of tuberculous bones was not merely an appendage to orthopaedics. A recent census of the Wingfield Orthopaedic Hospital had shown that of the 134 cripples and potential cripples well over two-thirds were tuberculous. Adolescents and adults presented a much more serious problem than children. To deal with adult tuberculosis was difficult; the best operative facilities and a highly trained surgical team were necessary.

PROBLEMS OF MALARIA PROPHYLAXIS.

CONCLUSIONS OF THE MALARIA COMMISSION OF THE LEAGUE OF NATIONS.*

BY

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THE thirtieth anniversary of the discovery by Sir Ronald Ross that anopheles mosquitos are hosts and carriers of the malaria parasite falls within a few days of this year's meeting of the British Medical Association. Since the discovery, many antimalarial campaigns based on its teaching have been undertaken in various parts of the world. It seems appropriate, in a discussion on the prophylaxis of malaria at this meeting of the Tropical Section of the Association, to consider what practical conclusions can be drawn from the results of those campaigns, and what general recommendations or suggestions can be made as to the antimalarial measures which appear, from the experience gained, to be most suitable in different circumstances and conditions at the present time.

It happens that, as *rapporteur* to the Malaria Commission of the League of Nations, I have recently assisted in drawing up the Commission's provisional conclusions on that subject, and perhaps those conclusions may serve as a basis for the present discussion. The Commission, as everyone knows, is an international group of expert malariologists and public health officers who were appointed by the Health Committee of the League of Nations in May, 1923, with the primary object of pooling experience in order to establish what antimalarial measures are most appropriate in certain European countries which have little money for the purpose, either because of general want of resources or for the reason that the funds available must be used in accordance with the relative importance of malaria as a cause of sickness and death in comparison with the importance of other diseases and conditions which affect the public health. This financial limitation adds greatly to the interest of the subject, but also makes the task of giving advice more difficult. The Commission has studied the problem in various ways, but chiefly by undertaking collective study

* The opening paper of a discussion in the Section of Tropical Diseases at the Annual Meeting of the British Medical Association, Edinburgh, 1927. Dr. Andrew Balfour, President of the Section, was in the chair.

tours in malarious regions of Europe and neighbouring countries, where an endeavour has been made for some years to deal with malaria in the light of existing knowledge and experience. During these journeys observations made by individual members of the Commission are examined by other members, and the results are discussed in full session by malariologists belonging to very varied schools of antimalarial practice and opinion. In this way individual views become modified and the Commission as a whole endeavours to arrive at an impartial judgement regarding what may be the wisest course to pursue in different circumstances when due consideration is given to administrative and social and economic, as well as to technical difficulties. In most instances, of course, the final view of the Commission as a whole represents a compromise between opposing tendencies—a compromise which may be called the "average opinion." It is believed that these mutual discussions are the first occasion on which the collective thought of malariologists of different countries, and different schools of teaching and practice, has been brought to bear on local problems of malaria prophylaxis studied on the spot.

With this preliminary explanation I propose now to bring to your notice some of the conclusions referred to. In the time at my disposal I must limit myself to those which seem to be of most importance, and I can only summarize very briefly the information and reasons on which the conclusions are based. For further details I would ask those who will take part in the discussion to consult the printed report[1] which has been distributed.

1. One of the first and most important conclusions stated by the Commission is that at the present time, in the vast majority of the numerous regions where malaria prevails, antimalarial measures should be limited to an endeavour to reduce the severity and, so far as may be possible by the same measures, the incidence of the disease. They are of opinion that measures designed to accomplish more than that (and particularly measures aiming at "eradication") are not a wise proposition, and can be justified only in very exceptional circumstances. As regards this conclusion it is realized, of course, that the limited aim is not entirely satisfactory—that, as Professor Gosio[2] has written, "No victory is real that does not overcome the endemicity of the disease and suppress its sources; failing this we can only claim to have scotched an ever-threatening enemy whose reawakening is an ever-present possibility." This is true, but in the thousand and one small towns and villages of every affected country the "scotching of the enemy" is all that can be hoped for, and, in the present state of knowledge, it is all that should be aimed at. The Commission points out that those who are dissatisfied with this limited aim may derive comfort from the knowledge that it is all that has been accomplished even in countries like England, Holland, and Denmark, which, geographically, financially, and in every other respect, are much more favourably situated for obtaining success in the "eradication" of malaria than is any other affected country.

2. A second conclusion of general interest is that it is not always necessary to deal with malaria by a method arising directly out of the knowledge that the disease is transmitted by mosquitos. In this connexion the Commission cites various regions and localities in which, in the past, malaria was robbed of its importance as a cause of sickness and death without any knowledge of the etiology of the disease, and without any reduction of anopheles having occurred, as well as various localities in which the same result is being brought about to-day. The Commission observes that, since the advent of the knowledge that malaria is transmitted by mosquitos, there has been a tendency to forget that there are many methods of dealing with the disease, and that some of them are effective even without an attempt being made to reduce mosquitos. Therefore they are of opinion that in certain circumstances it is very desirable for antimalarial workers to throw off the tyranny resulting from the general belief that because mosquitos carry malaria their elimination should be the chief object of concern and expenditure.

3. A result of the Commission's inquiries which is closely related to the conclusion just stated is the recognition that there is not yet any single method of malaria control which can be described as being superior to all others and therefore to be adopted in every country. There are, as has already been said, a number of methods of control, and some of them are constantly being improved. Each or any of them may, either wholly or in part, render valuable service in a country if it is a method well suited to the local conditions. This suitability or adaptability to local conditions is one of the most important matters to be considered in a choice of methods, and it is essential to the success of the method chosen. Malaria control is a *local problem* to a much greater degree than is the case with the control of other infectious diseases. Therefore in every country, and very largely in every area, there must be preliminary examination to ascertain the local conditions before deciding what method of malaria control is best adapted to them.

4. Omitting the Commission's suggestions for ascertaining the amount and character of malaria in the locality and for ensuring that a continuous record on that subject will be kept, I turn now to the actual methods of controlling malaria which the Commission considers it desirable to recommend. First, I must say a word on the vexed question whether it is better to utilize several of the known antimalarial methods at the same time, or to concentrate all available effort on one carefully selected method. This is a specific question which was put to the Commission by the public health authorities of several countries visited. The answer given was that, in the opinion of the Commission, it is better to limit the action taken to one or two selected methods, which can then be brought to a high degree of perfection. If, after a fair trial, these one or two measures are found to be insufficient to rob the disease of its practical importance from the public health point of view, further methods can be systematically added until the desired end is attained.

5. As regards the particular methods of malaria control to be adopted in any country or area, the Commission considers that there should be considerable freedom of choice. It deprecates the adoption of measures in a country on the ground that they have been successful in another, where, perhaps, circumstances and conditions are quite different. Each country, and to a more limited extent each locality, must "work out its own salvation" in this matter, and the suggestion is made that countries and localities should do so in greater degree than has hitherto been the case. On this point the Commission states that in some of the countries which they visited there was evidence of an endeavour to follow too slavishly the antimalarial policy adopted in some other countries without ascertaining its suitability to the local circumstances and conditions, and in some instances without interpreting correctly its purpose and without giving full weight to the considerations which determined its adoption. As an example, they note that, in the world generally, there is a widespread misapprehension regarding Italian antimalarial methods, and that, in some countries, money, energy, and time have been misapplied in the false belief that the Italian example was being followed.

6. It is usual to classify antimalarial measures as direct and indirect. The Commission adopts that classification but defines the terms more strictly than is usual. In the Commission's view there are only two direct antimalarial measures—namely, killing the malaria parasite in man, and killing the malaria parasite in infected mosquitos. In comparison with these two measures, anything else that can be done to control malaria is necessarily indirect. For example, no one who has made a particular study of antimalarial campaigns can doubt that general antilarval measures in the field, as usually carried out in practice, are an indirect method of trying to deal with human malaria—that this line of action is concerned with something which is remote from the particular knowledge of the etiology and epidemiology of malaria which we are fortunate enough to possess to-day.

[1] *Principes et méthodes de lutte antipaludique en Europe.* Deuxième rapport d'ensemble de la Commission du Paludisme. Published by the League of Nations at Geneva as Document C.H./Malaria/73. 1927.

[2] *International Journal of Public Health*, vol. i, No. 2, September, 1920, page 178.

7. Adopting this restricted definition of direct and indirect means of controlling malaria, the Commission suggests that in every malarious locality certain direct methods, which they term "primary measures" and which are concerned with malaria-infected individuals and the interior of the houses in which they live, are indispensable. As regards measures relating to malaria-infected individuals, the Commission considers that, whatever else it may be possible to do in malarious localities, the first and most important thing to do is to arrange for the treatment of cases of the disease. In rural areas and localities under primitive conditions the State must make these arrangements, according to the means available, but at least an efficient arrangement for the gratuitous supply and effective distribution of quinine is indispensable. The Commission considers that in organized communities satisfactory diagnosis as well as treatment should be arranged for, and suggests that, wherever possible, the services of private medical practitioners already established in the locality should be utilized and paid for by the State for this work.

8. The Commission recognizes that no useful purpose would be served by magnifying unduly the results that may be obtained by those arrangements for ensuring early discovery and effective treatment of cases and carriers. They have ascertained that, in the countries which they visited, nothing is more striking than the mild character of the manifestations of malaria in a locality where there are practising medical men who are fully equipped as to the diagnosis and treatment of the disease, as compared with the severe and often fatal manifestations in a similar locality which is without that expert medical aid; but they realize also that the good results are more apparent in the reduction of severity and mortality than in the reduction of incidence. This is not surprising in view of the knowledge that quinine is not an effective prophylactic for new infections or relapses, and in view of the difficulty of attaining the "minimal effective standard" in the execution of the measures. Regular inspection of school children and of organized classes of the adult population must be part of the system, and an endeavour must be made to follow up all patients in their homes. The officer who is in charge of the measures will need assistants, especially for house-to-house inquiries. In some countries duly qualified female "health visitors" who have received the necessary training may be usefully employed in this work. In small districts the office can be combined with kindred health duties, such as school nurse, tuberculosis visitor, etc.

9. The other "primary measure" which the Commission recommends is the systematic killing of adult female anopheles mosquitos which can be found in the interior of dwelling-houses. It would take too long to describe in this paper the epidemiological and experimental grounds on which the Commission has arrived at the conclusion that this measure, if it could be effectively carried out, would have very remarkable results. As to the manner in which it should be done, the Commission considers that, wherever it may be practicable to persuade householders themselves to undertake it, that arrangement is preferable to an organized arrangement by the authorities for killing mosquitos in houses by periodic fumigation or other means. In the Commission's view the measure should be regarded as an important item in the sanitary education of the inhabitants of malarious areas. The Commission thinks that it should be a duty of the medical men and assistants who visit households to explain to the occupants how malaria is contracted and spread, and to demonstrate to them how to find and kill the adult anopheles mosquitos which are present in the house. It should be explained also how to make the house inhospitable to anopheles by removing cobwebs and dirt, clearing out recesses and dark corners, whitewashing, arranging for more light and air, and other simple means suitable to the particular locality and type of dwelling. Female health visitors and health nurses, who have been properly instructed and trained, can do a great deal of good by instructing householders on these matters. The aim should be to teach the inhabitants to have the same dislike and objection to the presence of gorged and sluggish mosquitos in their houses as cultured people already have to the presence of bed-bugs, lice, and other harmful and disgusting vermin. If this educational propaganda is successful, it may be hoped that in time the killing of anopheles mosquitos in houses will become a routine part of the housewife's daily task, just as much as other more showy, but less useful, items of sweeping, brushing, and cleaning. The measure has the advantage of costing nothing. It is known, from the results of experimental laboratory work, that one infected mosquito can give malaria to as many as thirty persons; therefore it is difficult to praise too highly any person who succeeds in killing even one of these infected insects.

10. As regards these two primary or direct measures, the Commission is well aware that there is nothing particularly new or original about the idea of endeavouring to combat malaria in the houses of the people themselves rather than in the general environment. They realize also that it is often a difficult matter to get into the houses of the people, to examine all the occupants, to treat those who are found to be infected, and to teach them to catch and kill the mosquitos which may be hidden in inaccessible places. But no royal road or short cut to the prevention of malaria has yet been found. Therefore, in the opinion of the Commission, it is necessary for the present to continue to endeavour to combat the disease itself at its sources in the human and insect hosts.

11. The Commission has carefully considered in what circumstances any other measures than those dealt with should be recommended, and what those measures should be. On this subject reference is made in the first place to the problem of what should be done in regions where the conditions in which the people live and work are so primitive, and their economic position and social status and culture are so poor, that it is not possible in practice to apply direct antimalarial measures in a manner which enables them to be brought to the "minimal effective standard." Except the free distribution of quinine, no effective antimalarial measure can be applied in these regions until the land has been brought into such a condition that it is worth the while of the inhabitants to settle permanently upon it, and until those permanent settlers have reached a fair standard of housing and living. Nothing is more favourable to a high incidence and severity of malaria than frequent movements of a population hither and thither in search of a bare living, and very few things have a greater effect in reducing malaria than the stability of the population which comes when a place where the conditions of life are tolerable is found. Agricultural reclamation of the land, so that people may be settled permanently upon it with a fair prospect of gaining a livelihood, and perhaps a decent house and moderate comfort, is therefore a measure which tends indirectly to produce a great reduction of malaria. In general, the better the agricultural reclamation is carried out from the point of view of increasing its productiveness, the quicker will malaria seem to disappear as an important cause of sickness and death—provided always, of course, that the people themselves share in the improved prosperity by being able to adopt a higher standard of housing and living. It is hardly necessary to say that, when reclaimed land is worked by hired labourers who receive only a small daily or weekly wage and live a life of great hardship in temporary huts and hovels, there is no improvement of malaria among them. Indeed, in the tropics (and even in some parts of Europe) highly cultivated areas where these conditions obtain continue to be among the most malarious in the world. This indicates that the actual measures necessary for agricultural reclamation or improvement of the soil (drainage, etc.) are not the factor which causes the health of the people to improve, but that the good result is due to the better conditions of living and housing which the increased productiveness of the soil enables the people to obtain. In this connexion the Commission notes that the changed conditions of life just referred to, and the subsequent reduction of malarial incidence and severity, have often been brought about in the absence of any measures intentionally based on modern knowledge of the etiology and epidemiology of malaria, and they illustrate this truth by describing a small scheme of "bonification without antilarval or other antimosquito methods" which was demonstrated to them during their tour in Sicily. The

place is now an example of "anophelism without malaria." For these and other reasons the conclusion to which the Commission has come is that, of all indirect methods of reducing malaria, most importance must be attached to general schemes which aim at improving the economic and social conditions of the people and their general well-being and standard of life.

12. The Commission has ascertained that almost everywhere in the countries which they visited terms like "bonification," "assainissement," etc., are misunderstood and misinterpreted except in the particular countries where the terms originated. They find also that in some countries the false belief still prevails that the actual measures which are necessary for making land more suitable for cultivation and more fertile are the means by which the reduction of malaria is brought about. In particular the drainage which is necessary for agricultural land reclamation is often credited with being the chief agent concerned. It is assumed that the drainage acts by reducing the breeding places of anopheles mosquitos. In support of this belief it is often said that even the ancients knew that drainage reduces malaria, and that this antimalarial action of drainage was explained when the role of the mosquito was discovered. One result of the belief is that some countries have adopted drainage on a large scale as their first line of attack against malaria. The Commission does not desire to limit the output of public works of proved utility, but, having regard to the financial aspect of its mandate, they are equally unwilling that countries should continue to believe that the kind of drainage which is necessary for agricultural reclamation of the soil is an important antimosquito measure. For it is now known, unquestionably, that the open ditches and canals by which swamps and marshy areas are drained for agricultural purposes are often more prolific breeding places of anopheles than were the original swamps themselves. The Italians are well aware of this. They do not regard the "large bonifications" as an antimosquito measure, and they know that such a bonification may increase the abundance of anopheles in the area reclaimed. But they know also that in an area where bonification has been completed, and where, in consequence, the inhabitants settle permanently in better houses and in all the other circumstances of a moderately good standard of life, malaria tends more or less quickly to lose its importance as a cause of sickness and death. This good result more than compensates for an increase in the abundance of anopheles in the general environment. Thus it appears that the measures themselves are only a means to a definite end which is to be pursued despite the knowledge that some of the measures may be of a kind which actually favours the incidence and spread of malaria. Therefore what we learn from the Italian example (and equally from the older and more extensive Dutch examples) is that we must not take each of the actual bonification measures (such as drainage) separately, and utilize it as a single antimalarial measure in another country. If "bonification" is the antimalarial measure which we desire to employ, it must be understood to mean a many-sided process. Our scheme for "bonification" must be comprehensive; it must include particularly the arrangements for settling the people permanently, for raising their standard of life, for better housing, better education and general welfare, for making scattered houses easy of access by good roads and canals, for better medical attendance, and, in general, for all the social and public health improvements which are an integral part of a complete bonification scheme in Holland, Italy, and other countries where such schemes have been successful. As I have already mentioned, the essential importance of these items in the scheme is brought home to us by instances in which, when the inhabitants of reclaimed and highly cultivated land are not permitted themselves to reap the advantages of the increased productiveness of the soil, no improvement in malaria results. Obviously, therefore, the sphere of the public health officer and the malariologist in connexion with schemes of agricultural land reclamation consists particularly, not in trying to enforce antilarval measures during the progress and after the completion of the work, but in seeing that the agricultural improvement has been accompanied and followed by an equal improvement in the conditions of life of all the people who inhabit the reclaimed area. This change in the conditions of life of the inhabitants is the most important antimalarial factor in bonification schemes.

13. The Commission deals in separate chapters of the report with various other problems of malaria prophylaxis, particularly with the organization necessary for the work, and with different antimalarial and antimosquito methods —such as quinine treatment and prophylaxis, larvicides, the applicability of antilarval measures, housing as an antimalarial measure, and propaganda. From lack of time I cannot refer to these subjects in the present paper.

14. But there remains a subject which I must not omit to mention. For various reasons which are given in the report, the Commission is unanimously of opinion that the scientific study of malaria must be continuously pursued in the laboratory and the field. They consider that the best prospect of discovering a method of dealing with malaria which can be applied in affected localities with the small amount of money and means that can usually be provided, lies in renewed activity in the study of the disease in all its aspects. Therefore they suggest that each Government which has not already done so should establish a small central permanent organization of selected workers who would devote their whole time to malaria research. In this connexion they suggest (*a*) the establishment in one or two malarious areas of each country of an "observational station" where certain routine epidemiological inquiries should be made at regular short intervals for several years; (*b*) the establishment in each country where malaria is used therapeutically of a laboratory for the cultivation of a pure strain of malaria in mosquitos, to be used, under expert supervision, for the purposes of the treatment. The establishment of such a laboratory in a properly organized hospital automatically provides an opportunity of studying the clinical and parasitological features of malaria contracted in the natural way, as well as the circumstances governing the infection of anopheles and the persistence of the infective virus in those insects. It also enables a satisfactory study to be made of the action of quinine and other drugs which are used for the treatment of malaria. Examples of each of these institutions are described in the report, as well as an example of a station for "experimental malaria control."

DISCUSSION.

Lieut.-Colonel E. D. W. GREIG, with the aid of lantern slides, outlined the points bearing on malaria prophylaxis which emerged from his study of eighteen cases of intentionally induced malaria. He divided his cases, as regards susceptibility, into (1) refractory, and (2) ordinarily susceptible; the difference was very clearly observable, but in this series there were none which could be classed as very susceptible. He recalled that James had ascribed resistance to infection to some property of the blood or tissues of the recipient and not to an insufficient dose of sporozoits; and he discussed the views of Christophers as to immunity against malaria, expressing the opinion that some test which would differentiate good and bad infectors of mosquitos would be of service for prophylaxis. In his cases the period of latency after infection varied from six to twenty days. Sexual forms of the parasite did not appear until six or seven days after the disease declared itself, so that, allowing three days, which James held to be necessary before gametocytes could infect mosquitos, a patient in a primary attack would not be capable of infecting mosquitos until about ten days further had elapsed. Such intentional infections as those described afforded opportunity for study of the parasiticidal power of drugs.

Dr. L. W. HACKETT (Rome) described the use of Paris green in the antilarval measures undertaken by the International Health Board in Italy.

Dr. DRBOHLAV (Prague) gave an outline of the conditions of occurrence of malaria and the methods used against the disease in Czechoslovakia.

Professor E. MARTINI (Hamburg) feared that the report of the Malaria Commission would be interpreted by

Governments as meaning that by supplying free quinine they could discharge their whole duty regarding malaria. He leaned towards the preventive methods described by Dr. Hackett, but he agreed with Colonel James that there was perhaps too great a tendency to adopt mechanically for every country a measure which had anywhere produced good results. For malaria prevention there was no fixed rule; each district required individual consideration. At a place he visited near Astrakhan prophylactic quinine was the only measure applicable to local circumstances. Angora was nearly abandoned as the Turkish capital on account of malaria; quinine alone was ineffective, but when this was coupled with well considered drainage the disease was controlled, and anopheles became rare. In Anatolia it was the experience of local doctors that apparent resistance to quinine often disappeared when an ascaris infection had been eradicated. In his view the cases of so-called spring malaria were nearly always relapses of autumn infections. In Turkey he had acted on this belief as regards his personal prophylactic measures, omitting all precautions up to the end of May even in districts where malaria was endemic, and he had no reason to regret his action.

Dr. P. H. Manson-Bahr (London) gave his experience with plasmochin and its compound with quinine in the treatment of malaria. He considered that this new drug, from its action on the gametocytes of tertian and subtertian parasites, would have considerable bearing on the prophylaxis of malaria in the future. All who had used it were agreed as to the phenomenal rapidity of its action upon the crescents of subtertian malaria, which disappeared from the circulation within three days after the exhibition of 0.24 gram of plasmochin. He quoted a striking illustrative case in which the compound was successfully employed after full doses of quinine had proved unavailing, and in which disintegration of the gametocytes was observed microscopically. The drug was well tolerated, and if it were possible to treat a malaria-stricken population daily with small doses, the transmission of infection through the anopheles would soon cease from destruction in the blood stream of the gametocytes. Under the present system of quinine prophylaxis the formation of gametocytes in peripheral blood was rather encouraged than the reverse.

Colonel S. P. James briefly replied to the discussion.

ASTHMA AND TUBERCULOSIS IN RELATION TO "CLIMATE ALLERGENS."*

BY

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We began about 1919 to investigate the action of various allergens on asthmatics, and found that only about 15 per cent. of our cases could be classified as supersensitive to the four groups of allergens known at that time—namely, pollens of various grasses and flowers, epidermal products, foodstuffs, and bacterial vaccines. We had, however, also noted those asthmatics who could not be classed under one of the four headings mentioned, but had yet to be considered supersensitive, although we were unable to identify the causative allergens. Among other things we found that more than 90 per cent. of asthmatics give a positive skin reaction to an extract of dandruff of human skin, whereas normal persons only react to such an extract in exceptional cases, proving that the skin at least of these patients is supersensitive.† Thus about 80 per cent. of our asthmatics suffered from some form of allergy, but the causative agent of their attacks was unknown.

In our endeavours to find the cause of the attacks in these 80 per cent. we utilized the known fact that the environment of the asthmatic patient is, as a rule, of primary importance in determining the intensity and frequency of his attacks. It is known that most asthmatics are free from attacks at high altitudes. Turban and Spengler, who have published statistics for Davos (about 5,000 feet), found that 68 per cent. of all asthmatics going to Davos become free from attacks within two or three days, that 25 per cent. improve considerably within two or three weeks, and that only 7 per cent. remain uninfluenced. It is also known that residence at the seaside or a sea voyage often improves the condition of asthmatics. This can be observed also in a flat country like Holland, where the health of asthmatics varies greatly in different regions. The character of the soil is also of great importance, sandy soil and a low level ground-water offering much better conditions for asthmatics than clay and peat soil and a high level ground-water. Recently these observations have been confirmed completely for Ost Preussen by Tiefensee, working in the clinic of Matthes in Königsberg, who found that from 1,100 asthmatics living in East Prussia, more than 90 per cent. had their houses on clay, moor, or peat soil, and only a very small number on sandy soil.

These observations exclude the known factors of climate, barometric pressure, temperature, humidity of the air, etc., as direct causes for the incidence of asthma, and make it clear that the conditions of the soil are of paramount importance. As will be shown later, humidity may play an important part in making a place "bad" for asthmatics, but it does this by facilitating the growth of certain micro-organisms which constitute the determining causes of the asthmatic condition in different regions.

Mainly on the basis of such observations we formulated the hypothesis that the difference between various climates is due to certain allergens in the air, the presence of which is dependent on factors of climate; they may be called climate allergens. These climate allergens must be considered as the principal causes of asthma in all flat countries with a high humidity and a moist soil.

In my monograph on allergic diseases[1] I fully described the results of experiments made to prove the validity of this hypothesis. Among other things it was shown that outside air in a place known as very bad for asthma (Rotterdam) contains water-soluble colloidal substances, which on injection into sensitive persons induce attacks of asthma, and that dust from the floors of private houses gathered in regions where asthma is very frequent contains many more allergens than dust from places which are good for asthma. In Switzerland there is a gradual diminution in the allergen content of house dust corresponding to the height of the place.

A number of allergens which may be considered representatives of groups of climate allergens have been determined. The first examples were found by us as the result of reading a paper by Ancona, who observed an epidemic of asthma in an Italian village, the cause of which was traced to a parasite occurring in grain (*Pediculoides ventricosis*) which formed allergens, to which most of the people who frequently handled this grain became sensitive. We then found that other insects—that is, the common mites which so frequently occur in grain, hay, and straw and packing material—form allergens which may be the exciting cause of asthma in about 20 per cent. of our cases. Later we found that common moulds, like *Aspergillus fumigatus*, and other aspergilli, penicillium, mucor, etc.—moulds that are abundant in moist and damp houses—form allergens to which more than 50 per cent. of our asthmatics are sensitive.

Since these allergens formed by moulds are to be considered as typical representatives of a group of allergens which is certainly most important for the entire problem of allergy, we will have to study their properties in detail.

Properties of Mould Allergens.

1. Mould allergens are soluble in water and are of colloidal nature; they are not destroyed by heating to 120° C., nor by acid, alkali, or formaldehyde. They are

* This article is a synopsis of a series of three advanced lectures given at the London University in February, 1927.

† These results have been confirmed by Professor Rost in Freiburg (Germany).

not soluble in ether or chloroform, and are probably not proteins or lipoids. They are harmless to normal animals or men, and do not act as anaphylactogens in guinea-pigs or rabbits, so it has not been previously possible to sensitize animals with these allergens.

2. *Skin Reactions on Human Beings.*—In about 50 per cent. of our asthmatics these mould allergens give positive skin reactions after subcutaneous injection, whereas normal persons are as a rule negative. These reactions are sometimes very intense, so that the entire forearm at the site of injection is swollen, red, and tender, and so remains for two days.

3. *Effects of Subcutaneous Injections on Human Beings.*—Subcutaneous injections in normal persons give no reaction. Sensitive people, however, may react in a peculiar way. Small doses, about 1 in 1,000,000 or less of our standard extracts, often have a decided therapeutic effect, in that if repeated at short intervals they serve to desensitize a patient, sometimes to a considerable degree. Slightly higher doses—that is, 1 in 100,000 of the standard extracts—may cause symptoms of vasomotor rhinitis, headache, rise in temperature, and general malaise. In very sensitive people the 1 in 1,000,000 dilution, or even 1 in 10,000,000 dilution, may have the same effect. Higher doses, or the same doses in a sensitive patient, may produce violent attacks of asthma and even be dangerous. The symptoms following the injections of mould extract last two or three days, and may be stopped by the injection of a solution of sulphur in oil.

4. We have been able to prove that the serum of patients supersensitive to moulds contains substances which may transfer this sensitiveness locally to the skin of normal persons; this serum also contains substances which may inhibit the action of the allergens in sensitive persons. Both kinds of substances are strictly specific. The presence of a "transfer substance" is shown by the experiment of Prausnitz and Küstner. If 0.1 c.cm. of serum from a patient supersensitive to a certain mould extract is injected into the skin of the flexor aspect of the left arm, and next day 0.1 c.cm. of mould extract is injected in the same place and 0.1 c.cm. of the same extract as a control in the right arm, the injection in the left arm will produce a large urticarial wheal, but the result of that on the right will be negative. This experiment proves beyond doubt the importance of moulds as a factor in allergic disease.

The presence of specific anti-allergens may also easily be shown. If 0.1 c.cm. of a solution containing a mould extract diluted 1 in 10 with physiological saline is injected intracutaneously on the flexor aspect of the left forearm of a patient supersensitive to moulds, and in a corresponding place on the right arm a 1 in 10 solution of the same allergen diluted with the patient's own blood, is injected, the reaction on the left arm will be positive and on the right arm negative.

Whether these anti-allergens are identical with the "transfer substances" is not certain. The experiment described proves that the moulds investigated form allergens, which may induce symptoms of illness in persons supersensitive to them, and the conclusion is strengthened by the fact that all the moulds used have been cultivated from material occurring in the close vicinity of asthmatics. We very frequently find *Aspergillus fumigatus* growing readily in kapok, which is used for stuffing mattresses in my country; moulds can be cultivated from house dust, from grain, and from human dandruff—in fact, from the most varying sources, but all accessible to asthmatic patients. Although we have only investigated the allergic properties of about sixteen moulds, many others may act in the same way, as well as some micro-organisms, such as bacteria and yeasts. Other climate allergens, perhaps more important than these, may yet be found, but so far as we can see at present the relation between mould allergens and allergic diseases is the same in all low-lying countries. Those investigating this subject must not forget that the kind of micro-organisms producing climate allergens may be different in different countries.

So far we have produced evidence for the theory which ascribes the beneficial influence of high mountain climates for allergics to the absence of climate allergens in the air. The final proof can be reached in another way. If the beneficial influence of residence in high altitudes is due to absence of climate allergens, it should be possible to obtain the same improvement in Holland or any other low-lying country, provided that conditions could be realized which in respect to the air were identical with those in Switzerland. With the help of W. Einthoven, jun., we have succeeded in constructing an apparatus for investigating this. As this apparatus is installed in a special clinic for allergic diseases, and forms the basis of our work during the last three years, it must be described in some detail.

The Clinic for Allergic Diseases.

The clinic is established in two private houses rented for the purpose. The houses are rather badly built, damp, and situated on clay soil in a humid region near a canal. These are favourable experimental conditions, since we wish to demonstrate that, even in houses otherwise bad for asthmatics, it is possible by proper technical arrangements to make them suitable for these patients.

In several rooms of these houses small chambers have been built of eternit, a kind of asbestos, and a material on which bacteria or moulds cannot grow. The chambers contain an iron bed, an iron chair, and a small iron cupboard. Mattresses, pillows, and other bedding were new and sterilized before use; they were also regularly sterilized every month or six weeks, so that the possibility of micro-organisms growing in them and producing allergens is extremely small. Before going to bed the patient undresses in the room but outside the chamber, enters and shuts the door of the chamber, and stays in it during the whole night. During the first days of their residence in the clinic the patients often stay in the chamber during the daytime also. They are not allowed to take extra pillows, food, or any material which may contain allergens into the chamber. All the chambers in the clinic are ventilated by a large exhauster, which draws air from the top of an iron tube fixed alongside an iron tower 100 feet high.

The system described is the simplest, and for most of our patients it is sufficient. Nevertheless, the air with which the chambers are ventilated will contain a certain amount of dust and a certain amount of climatic allergens. Hence, in order to obtain conditions more nearly identical with those in high altitudes the air must be purified—a problem presenting considerable difficulties. So far we have tried three different methods, but only one could be put on an efficient economical basis; by it the air is purified by passage through a refrigerator.

In the clinic for allergic diseases in Leiden there is a refrigerator with a capacity of 4,000 calories an hour, and a cooling surface of 180 square feet, sufficient to bring the dewpoint of the outside air from 15° C. to 6° C., or from 10° C. to 1° C., or from 5° C. to −5° C, if about 200 cubic feet of air passes through it per minute. This is sufficient to ventilate three chambers for two persons each. The air cooled in this way has to be warmed by a central heating system before it enters the chambers. As a rule the temperature of the chambers is kept at about 70° F.; this keeps the relative humidity between 20 and 30 per cent. We do not yet know to what extent the dryness of the air influences patients beneficially, but if dryness is an important factor for them the conditions in the clinic compare favourably with those at high altitude sanatoriums. It is true that during the winter the relative humidity in a number of places at high altitudes will be lower than 20 per cent., but in spring and part of the summer the figures of most of these places are higher.

We have so far treated about 500 patients in this clinic, and have found that about 75 per cent. were completely, or almost completely, cured within some days, about 15 per cent. improved materially within some weeks, and 10 per cent. remained unaltered. In comparing these figures with those published by Turban and Spengler we find almost complete agreement. In our opinion this shows without any doubt that the conception of the influence of climatic allergens on the condition of asthmatics in various climates and at various heights is correct.

Application of the Principle of Allergen-free Air Chambers to Other Diseases.

Illnesses dependent on climatic factors are not limited to asthma and the other allergic diseases mentioned. Rheumatism is prevalent in moist and cold climates, and tuberculosis also. Highly interesting and careful investigations by Gordon, which were later confirmed for India by Sir Leonard Rogers, have demonstrated that great differences in the morbidity and mortality of tuberculosis exist between various regions in the same country, often quite near to one another—differences which are ascribed by these authors to the influence of strong rain-bearing winds. Most sufferers from migraine who have visited different places and different countries can tell of places where they are well and places where they always suffer badly. In those regions where the "Föhn" wind prevails its influence is very distinctly recognized by sufferers from migraine and epilepsy. In hot tropical climates there is in the lower regions a peculiar form of disease called "low fever," characterized by malaise and some rise of temperature; this condition is almost immediately cured if the patient moves to the mountains, but it comes back as soon as he returns to lower regions. The cause of this illness is unknown.

We do not suggest that in all these cases factors of climate are to be identified with the presence or absence of climate allergens, but we believe that some of these diseases should be studied from this angle. We ourselves started with tuberculosis, and also had the opportunity of studying five cases of whooping-cough in allergen-proof chambers. Our five patients with whooping-cough had severe attacks of typical coughing every hour or two on the day preceding their admission. They came into the clinic on the sixteenth, tenth, fourteenth, twentieth, and twenty-third day of the illness respectively. They were immediately put in an allergen-proof chamber ventilated with purified air and were not allowed to leave the chamber till their attacks had disappeared completely. As a result not only did the number of attacks of coughing decrease rapidly, but the intensity of the attacks was very much reduced; none of the children had in the clinic any attacks as severe as on the preceding days and nights at home. Although the benefit derived from this treatment is undeniable, we offer no explanation of it. Certainly we do not want to draw the conclusion that whooping-cough is an allergic disease; the subject is a matter for future research.

Pulmonary Tuberculosis.

We have elsewhere[2] discussed the reasons which led us to investigate the influence of allergen-free air on tuberculosis. Earlier in our work on moulds we made skin tests with mould extracts in tuberculous cases and found a fairly large number of positive reactions, and this, together with the consideration that high altitudes act beneficially on tuberculosis as well as asthma, suggested taking cases of tuberculosis into our clinic and observing how residence in an allergen-proof chamber would influence them. Although the number of patients so far is limited (16) there is already sufficient evidence that allergen-free air gives about the same results in treatment of tubercle of the lungs as high altitudes. We feel justified in making this statement, in spite of the small number of patients, because the conditions under which our therapeutic experiment was made were such as to exclude most sources of error. All these patients were suffering from severe tuberculosis. Physical and *x*-ray examination showed characteristic signs of proliferative disease and the sputa contained a great number of tubercle bacilli. Previous to admission they had been treated at home or in hospital in Amsterdam. They had during the preceding months or years spent the greater part of their time in bed, and none had lacked sufficient nourishment. Attention must again be drawn to the fact that the allergen-proof chambers used were built in the rooms of a private house, situated in a very moist and low-lying part, so that the only difference our treatment could make was that the patients were taken from a house in Amsterdam or somewhere else in the country, and brought into another house, certainly not better situated than the one they were in before, but in which they lived in a small chamber isolated from the rest of the house and ventilated with purified air. Factors of rest, good food, and careful nursing were the same as before, and the patients received no medicines or other treatment, hence, as far as one could see, the only therapeutic measures were fresh air, and in some cases dry air, and protection from climate allergens.

Of the first sixteen cases treated in this way, one was not improved, and curiously enough this was a case which we had considered to be a relatively slight one—a girl of 16 years with tuberculosis of the left apex. One other case, a woman of 26, with a large cavity in the left apex, although gaining considerably in weight and feeling better, did not show much local improvement. A third case also only improved slightly, but all the others improved considerably. After having been in the chambers for one or two days the patients feel better, they breathe more easily, and they cough less. The quantity of sputum may or may not decrease during the first weeks, depending largely upon the presence or absence of a cavity. If no cavity is present the quantity of sputum may decrease quickly; if there are cavities the probability is that sputum will remain abundant and will only diminish very slowly, although in one of our cases with a large cavity (verified by *x*-ray examination) the patient was free from sputum within a month. The characteristic point, then, is that definite improvement occurs within a few days, and this is precisely what was expected, and is analogous with the improvement in our cases of climate asthma.

Of course, improvements in the patient's condition cannot be expected to show themselves in the physical examination of the chest until after some weeks have elapsed; then we find evidences of exudative processes being replaced by signs of fibrosis. In the cases favourably influenced the temperature settles after three or four weeks, and may remain normal entirely after two or three months. All our patients gained in weight, some of them considerably (15 kg. in some months). In two cases the patients went home against advice before they were sufficiently improved, and became worse almost immediately, although all conditions at home, with the sole exception of allergen-proof chamber and purified air, were the same as in the clinic.

Before considering the importance of the results given, I must call attention to the fact that so far I have only spoken of "improvement" and not of "cure" of tuberculosis. In order to appreciate the reason for this it must be remembered that in cases of "asthma" also we do not obtain a cure by keeping the patients in the clinic. Our cases of climate asthma are supersensitive to climate allergens, and consequently they will be subject to attacks in places where these allergens occur, and free from symptoms in places where they are absent. Tuberculous patients suffer from a bacterial infection, and in addition are sensitive to climate allergens. This sensitiveness handicaps the patient and forms an additional factor causing the tuberculous process to run a more severe course; it is this additional factor which is absent in our allergen-proof chamber. So the direct influence of this treatment—that is, the degree of improvement—will be mainly dependent upon the degree of sensitization to climate allergens shown by the patient, whereas the final result, including the question of permanent cure, depends on the relation between the virulence of the infection and the patient's resistance.

It seems to me that the possibilities suggested by these observations on the influence of climate allergens on tuberculosis are not exhausted here. There is another side of the question which has to be considered. We know that there is a relation between climate and tuberculosis. Why is the mortality and morbidity of tuberculosis high in some regions and low in others? Lack of good food and unfavourable conditions in factories and workshops are important factors, and another is the occurrence of climate allergens in the patients' environment. The knowledge of this factor may be of great help in the treatment of tuberculosis, but it may be of even greater help in prophylaxis. Preventive medicine should take this matter into consideration. If the simple transfer of a patient from one house to another in the same town or region can make all the difference to his

health (as was the case with the patients who came to our allergen-proof chambers) it must be realized that one obvious factor in the prevention of tuberculosis is to make the conditions at home similar to those in our clinic.

We feel that, for all patients who are free from symptoms of asthma in our clinic, or who, suffering from tuberculosis, are greatly relieved, the problem of their health has been reduced for the most part to a problem of technique.

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Remarks
ON
THE EPIDEMIOLOGY OF POLIOMYELITIS.*

BY

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POLIOMYELITIS is an acute specific fever which, in its complete expression, presents three distinct clinical and pathological phases. Clinically these are a short-lived initial phase of *constitutional disturbance*, followed by signs of invasion by the virus of the *subarachnoid space*, and finally by signs of involvement of the *nervous tissue* itself. Each phase has its pathological substratum. In the initial phase the virus obtains lodgement in the liver, spleen, and lymphatic structures generally, in all of which lesions are found. The virus then reaches the subarachnoid space and leptomeninges by channels which are not yet fully known, and gives rise to a reaction which is manifested by characteristic changes in the cerebrospinal fluid, and finally, invading the nervous tissue, it produces there the inflammatory lesions to which the paralysis is due.[8] The intensity of each phase varies, as do also the time relations of the first two phases. Further, the infection may die out after the first or the second phase, thus giving rise to the so-called "abortive cases." When infection dies out after a severe meningeal reaction we speak of a "meningitic" type of the disease.

The initial constitutional phase of poliomyelitis seldom presents sufficiently characteristic symptoms for identification, and it may be so mild that the patient continues to go about and thus has ample opportunities of spreading infection, since the virus is contained in the nasopharyngeal secretions. Like other infectious diseases it has its own seasonal and age incidence, incubation period, mode of spread, and susceptibility factor. Since the publication of Wickman's observations[9] it has been generally held that the infection is carried and spread by healthy carriers of the virus and by sufferers from the disease. From the nasopharynx of both groups of individuals a virus has been obtained capable of producing the disease in inoculated monkeys, and Flexner and Amoss[5] concluded that the nasopharyngeal mucosa during the ten days immediately following the initial signs of infection regularly contains the virus.

The two points to which I propose particularly to address myself are the question of non-human carriage of the virus, and a view which has recently been advanced to the effect that the sole agent in the spread of poliomyelitis is the healthy human carrier of the virus. Despite the inconclusive results of extensive search for non-human agencies of spread, these have not been finally excluded. Recently, in a small American outbreak, a strong case has been made out for milk as a possible agent of spread, and the whole question has thus been reopened.

An important modification of Wickman's views as to the joint responsibility of healthy carriers and sufferers from poliomyelitis in the spread of the disease has recently been suggested by Collier,[4] who believes that the disease is spread exclusively by the agency of healthy carriers, and that actual sufferers from the disease in any of its phases are non-infective to contacts, owing to loss of virulence in the infecting agent immediately the sufferer becomes infected. Elaborating this hypothesis, he states that every epidemic of poliomyelitis is preceded by a "carrier epidemic," in the course of which susceptible contacts are infected and an outbreak of the disease occurs. In any given area the presence of this army of carriers leads to the practically simultaneous mass infection of all available susceptible subjects. Further, he states that epidemics of poliomyelitis are characterized by a "rapid blaze, high peak, and rapid fall," a feature due to the mode of spread he describes. In such semi-isolated communities as country villages or boarding schools this manner of spread involves the universal and simultaneous striking down of all susceptible members of the community, and precludes the further extension of the disease within the community, with the result that all those not initially infected may safely remain within the infected community. The practical bearing of this conception is that all such communities should be kept together on the appearance of poliomyelitis within them and segregated from the surrounding society.

Since this hypothesis raises vitally important questions of public health and departs from the generally accepted body of teaching, it is essential that the data on which it is based should be carefully studied. Briefly, as formulated by Collier, these are: (1) the literature of the disease records no authentic example of case-to-case infection. Multiple cases within households are rare, and spread from a patient in a hospital ward is unknown. (2) The "rapid blaze, high peak, and rapid fall" of epidemics of poliomyelitis can be explained only on the basis of a preceding "carrier epidemic," and does not accord with case-to-case spread. (3) Finally, there is the categorical statement, for which no evidence is submitted, that at the moment of infection the virus ceases to be infective, thus rendering case-to-case spread impossible.

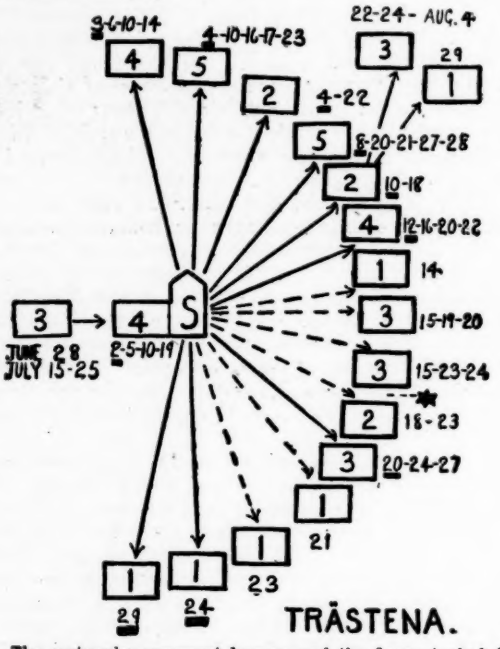
Before proceeding to discuss the first two postulates, let us summarily dismiss the third. It has been established by Flexner and Amoss that the nasopharyngeal secretions within the first ten days of onset of the disease contain a virus not less infective for the monkey than is that of a healthy carrier. For this susceptible animal there is, then, no loss of virulence. In the circumstances it is incredible that there should be a selective loss of virulence for the other susceptible animal, man. Throughout the whole range of infective agents pathogenic to man there is no parallel for the state of affairs thus alleged for the virus of poliomyelitis, and in the absence of evidence we may dismiss it as a speculation incompatible with the facts.

It is perhaps more difficult to establish unequivocally the occurrence of case-to-case infection; despite the strongest indications, it is always easy to maintain that somewhere in the background is the healthy carrier who is in fact responsible for spread; and while it may be impossible to demonstrate his existence at the relevant time and place, it may be equally impossible to exclude it. Nevertheless, we may reasonably object to the invocation of this factor in respect of every epidemic unless there is more substantial evidence of its operation than our inability to prove a negative.

In referring to the literature for examples of case-to-case infection it is essential to go direct to original sources in which all the facts of observation are recorded irrespective of their possible bearing upon the question at issue. For this purpose we cannot do better than turn to Wickman's original monograph on the Swedish epidemic of 1905. Wickman concluded, upon evidence which left him no alternative, that poliomyelitis tends to spread along the lines of human traffic, borne thereon by healthy carriers of the virus and by sufferers from the disease, more particularly during its initial phase and in its abortive form. Impressed as he was by the importance of the healthy carrier, he drew attention to the equally important role of the infected patient. Amongst the numerous foci of the disease analysed by him those in the parish of Trästena and on the islands of Sirkö and Borgö provide clear examples of a state of affairs incapable of explanation on

* These remarks were made in opening a discussion on the notifiable infectious diseases of the nervous system at the Annual Congress of the Royal Sanitary Institute, July, 1927.

the basis of a preceding "carrier epidemic," and establishing beyond reasonable doubt the preponderant role of case-to-case infection. The accompanying figure is a diagrammatic representation of the Trästena outbreak, modified from Wickman's diagram.



The rectangles represent houses, and the figure included within each is that of the number of cases of poliomyelitis in the house. Beside each house is given the dates of development of each case. Except in respect of the first and last cases the month is July. S = the school and attached schoolhouse. The arrows represent direction of spread, and those with interrupted lines indicate households infected by a healthy carrier. In the other households the initial case was a child actually attending school. The asterisk indicates the date (July 15th) on which the school was finally closed. (Modified from Wickman's Figure 2.)

In 1905 Trästena was a remote woodland village of some 500 inhabitants living in 119 houses; 49 cases of poliomyelitis occurred in nineteen houses, the first case developing on June 28th, and the last thirty-seven days later, on August 4th. The maximum number of cases developing on any single day was 4. Multiple cases in households were the rule, occurring in no fewer than thirteen of the nineteen infected houses. The maximum number of cases in a single house was 5. In the first eight households infected the initial case was a child attending school. The school was infected by the first case in the village, and the schoolhouse was the second household involved, four of the schoolmaster's children developing the disease. From this point household after household was infected, in six instances a school child who remained healthy carrying infection home from school. In nearly every instance an incubation period of three days or over intervened between the appearance of successive cases within a given household. The school was closed on the 15th of the month, and after that the epidemic rapidly declined.

Here we have a characteristic example of gradual spread of the infection within a semi-isolated community, the school being the centre of infection. The day-to-day case incidence both in the village as a whole and within individual households indicates a case-to-case spread, and is inexplicable on the basis of a preceding "carrier epidemic" and simultaneous infection of all available susceptible subjects.

In another outbreak cited by Collier himself we find evidence of the same order as that provided by the Swedish epidemic. I refer to the outbreak of poliomyelitis in the Devon village of Stokes Rivers in 1911.[7] At the relevant time this village contained 119 inhabitants living in eighteen houses. There were reported 36 cases of the disease, occurring in fourteen houses. Four houses, containing 8 children, escaped entirely. The main facts of the outbreak are as follows: The thirty-sixth and last case developed as late as forty days after the first; not more than 2 cases developed on any one day; multiple cases occurred in eleven of the fourteen infected households. In one house 9 cases occurred during a period of twenty-two days, with a definite incubation period between the onset of each. Collier's summary of this outbreak—namely, that it was "a swift scourge, which, lighting upon the little village of Stokes Rivers, could lay low in a few days 45 persons out of a total population of 119," is so out of harmony with the facts as to lend no support to his theory.

Finally, Burrows and Park[3] have analysed a very interesting small outbreak in a block of flats in an American city which provides further convincing evidence of the important role of case-to-case spread in epidemic poliomyelitis. In this instance 10 children out of a total of 18 were successively infected after exposure to preceding victims in the series.

These outbreaks are characterized by a complete lack of the features held to establish the exclusive role of the healthy carrier and the occurrence of a preceding "carrier epidemic" in the epidemic incidence of poliomyelitis. They show neither a "rapid blaze, high peak, and rapid fall" nor any subsequent immunity of susceptible subjects not infected at the outset. Multiple cases appearing successively within a single household predominated over single cases, while susceptible subjects proved liable to infection, with its attendant risks to life and limb, throughout the whole period of their stay within the infected community and until the epidemic had finally smouldered out.

If we consider the special case of a semi-isolated community of young children, containing in all probability a high proportion of susceptible subjects, there seems no doubt that their retention within an infected community is fraught with considerable risk of infection throughout the entire period of their inclusion.

The theory of the "carrier epidemic" and the exclusive infectivity of the healthy carrier, therefore, falls to the ground, and the practical bearing thereof is that the keeping together of a community in which poliomyelitis has appeared is dangerous to every member of the community in question, and cannot be regarded as a scientific measure of preventive medicine.

We must continue to hold, therefore, that Wickman's theory of case-to-case and carrier infection in poliomyelitis is correct, and must be the basis of procedure when epidemics occur. That there are no published records of the spread of the disease within hospital wards, either by carriers or by sufferers, cannot be interpreted as excluding case-to-case infection without also ruling out carrier infection. In any case the argument lacks force, since there are obvious factors contributing to this lack of hospital examples. For over twenty years poliomyelitis has been generally recognized as a contagious disease, and children admitted to hospital suffering from it in its acute phases are treated with the precautions usual in cases of infective disease, and their opportunities of spreading infection are restricted in consequence.

The question has also been approached from another point of view by Aycock and Eaton,[2] who, making a comparative study of the incubation periods of measles, scarlet fever, and poliomyelitis, find that in each disease incubation periods fall into two distinct groups, a short and a long. The former indicates simultaneous infection from a common source; the latter indicates true secondary case-to-case infection. On this basis, although true secondary cases of poliomyelitis are less common than those of the other two diseases, their occurrence seems undoubted.

There remains the question of non-human carriage and spread of the disease. From his analysis of a large series of cases Aycock[1] has come to the conclusion that transmission by human contact appears inadequate to account for some of the features of the epidemic occurrence of poliomyelitis, and that spread may occur in the apparent absence of this factor. He suggests the existence of non-human modes of spread, and indicates milk as one such possible agency for the carriage of the virus. He has subsequently reported, with Knapp and Godfrey,[6] a small outbreak in which there was evidence that milk may act as a vehicle of infection. Of this outbreak of ten cases, these authors remark:

"As to the Cortland outbreak, we would point out that the only cases to occur in a city of 15,000 people subsequent to the

appearance of three cases more than two months previously were, with one possible exception, in persons who drank milk from one dealer who sold less than 3 per cent. of the city's total supply; that the cases were distributed widely enough to make it improbable for the milk supply to be a mere coincidence of geographic distribution. When to these facts we add that an actual paralytic case of the disease existed on the dairy farm from which most of the milk came; that this patient was milking the cows and handling the milk for a period of four days while in the acute stage of the disease, and as the time which elapsed between this period and the dates of onset of the subsequent cases were consistent with the generally accepted minimum and maximum incubation periods of poliomyelitis, the chain of circumstances is as complete as is found in the majority of milk-borne outbreaks of other diseases. While this outbreak points to transmission by milk, we are of opinion that this is not the usual mode of spread of poliomyelitis."

In such outbreaks as are characterized by indications of common source or mass infection, therefore, such a non-human mode of spread must be considered. The sudden outbreak of poliomyelitis in a Kent sea-coast town last year comes to mind in this connexion, and suggests the possibility of such a mode of spread. It would indeed be unfortunate if an uncritical acceptance of the hypothesis of a preceding "carrier epidemic" were to lead to any omission to investigate searchingly every possible means of transmission, non-human as well as human, of this dread disease. One of the most striking dangers of speculations of the kind is that they are apt to make us think that we possess an adequate explanation of phenomena which are, in fact, extremely obscure in their causation, and thus to lead to a slackening of that rigorous and exhaustive search by which alone knowledge is to be gained.

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Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

TWO CASES OF INJURY TO THE CERVICAL VERTEBRAE.

THE two following cases of injury to the cervical vertebrae —one of them ending in death—seem worthy of record. There seems little doubt that in the first the nerve symptoms, though absolutely symmetrical in the upper limbs, did not result from cord injuries as the result of fracture of the sixth cervical vertebra, but from bilateral identical injury to the brachial plexus. All cords were involved, but mainly the inner, the injury to none being sufficient to abolish sensibility. The nature of the injury, the method of its production, and the complication of a fracture of the cervical vertebra make the case interesting and unusual.

CASE I.

A man, aged 58, whilst fishing fell from a bridge, a distance of about 12 feet, landing upon his head. He did not lose consciousness.

On admission to Bristol General Hospital on March 21st, 1927, he had a scalp wound extending for about 7 inches over the fronto-parietal region, with no skull injury. Neck movements he performed with care, but complained of no pain in that region. Both wrists were dropped, with complete loss of power. The thumbs were slightly abducted, and the fingers held flexed at the inter-phalangeal joints and extended at the metacarpo-phalangeal joints. His grip was extremely feeble, equally so on both sides. Shoulder and elbow movements were weak and sluggish. Anæsthesia was absent in both hands and arms, the patient being able to appreciate a touch with wool, but he complained of a tingling sensation passing from his wrists to his fingers.

Abdominal reflexes were present; the knee-jerks were normal and equal on both sides; the plantar reflexes were flexor. There was no loss of function or power in the lower limbs and there were no sensory changes.

The day following admission to hospital his temperature rose to 102° F., and his pulse from 64 to 98. He became dull, and towards evening he was slightly delirious. The paresis remained unchanged. He had not passed urine. The third day his mental apathy continued, and there was oedema of forehead and eyelids, extending down both sides of the neck and affecting most the posterior triangles. He lay with his arms across his abdomen. He passed urine normally, and a normal motion of his bowel had taken place. *X*-ray examination showed an oblique fracture of the body of the sixth cervical vertebra with a slight degree of compression.

From this day he commenced to improve. The weakness and stiffness in his arms gradually disappeared; he became able to move the wrists, but his grip was still feeble. There were no abnormal urinary or bowel symptoms, nor at any time evidence of any affection of the lower limbs. After six weeks in hospital he was discharged as a walking patient, wearing a neck plaster; the only remaining symptom was a rather weak hand-grip.

CASE II.

A youth, aged 21, fell from a roof on to the back of his neck; he was very dazed but not unconscious. On examination in the out-patient department he was found to have a small cut on the back of the head. He was quite conscious, and complained of pain in the neck and down the right arm. Movements were free, and there were no sensory changes. He refused to remain in hospital.

The following day he walked to the out-patient department, but, his symptoms having become worse, he was admitted to hospital. The pain in his neck and arm was still present, but he now held his head stiffly, and turned towards the left. Paresis of the right arm was marked, but no sensory changes could be elicited. That same evening he suddenly collapsed and died. *Post-mortem* examination revealed a fracture of the posterior arch of the atlas, with some oedema and minute haemorrhages in the cord.

I am indebted to Professor E. W. Hey Groves and to Mr. Duncan Wood for permission to publish these cases.

JOHN J. ROBB, *M.C.*, M.B., F.R.C.S.Ed.,
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CARCINOMA A COMPLICATION OF PILES.

IT is not unusual to see piles the result of carcinoma, but the following case illustrates the reverse condition:

A lady, aged 62, had been operated on for piles fifteen years previously, but the symptoms recurred about nine months ago. The clinical features were characteristic of external and internal piles, which became inflamed and prolapsed at intervals. A slight amount of blood and a little mucoid discharge were noted. In addition to the prolapsed internal haemorrhoids several external piles were present, but one was larger and firmer than the others. It seemed to be an organized thrombosed pile with considerable inflammatory thickening and slight ulceration of the surface. The inguinal glands were not enlarged.

At operation the possibility of this pile being malignant was considered and its excision with a fairly wide margin of skin and mucosa was carried out in conjunction with the operation for the prolapse. The base was not adherent to the external sphincter.

On section the usual structure of an organized thrombosed pile was seen, but in addition the surface skin showed definite malignant changes—squamous-celled carcinoma with cell nests, downgrowths of epithelium, and round-celled infiltration. Subsequently bilateral inguinal adenectomy was performed, but the glands showed no sign of invasion.

I examined the patient six months after the first operation and found no sign of recurrence.

This case illustrates the importance of submitting to microscopical examination all tissues removed at operation. Without it this condition could not have been diagnosed. More recently I met with a case in which there was advanced leucoplakia of the skin overlying an external pile —presumably a pre-cancerous condition.

I am indebted to Mr. K. W. Monsarrat, surgeon to the Northern Hospital, Liverpool, for permission to publish these notes.

PHILIP HAWE, M.B., Ch.B., F.R.C.S.,
Surgeon Assistant and Registrar, Northern Hospital, Liverpool.

LONG UMBILICAL CORD COILED ROUND NECK.

THE following case of an unusually long cord coiled six times round the neck appears worthy of record:

A multipara, aged 29, was delivered of a full-term female child, weighing 5½ lb., in University College Maternity Hospital on July 7th, 1927. Vaginal examination, ten minutes previous to the delivery, showed the head in a deflexed attitude, the anterior fontanelle being well down. The position was right occipito-anterior. After the head was born one loop of cord was pulled over it, before the rest of the child was rather precipitously delivered. There were then five more coils round the neck. The length of the cord was 58 inches (147 cm.). The insertion of the cord was central, and the placenta and membranes were complete. No signs of foetal distress were apparent before delivery, and the child commenced breathing quite normally when born.

The average length of cord is given as about 50 cm., and the limits are from a few millimetres to 198 cm. The source of this much quoted figure is Hyrtl's book *Die Blutegefässe der menschlichen Nachgeburt* (1870). De Lee (1913) states that cords over 100 cm. in length are very

rare. McCaffrey (1927) has collected five cases in the literature in which there were more than four coils round the neck; the highest number was observed by Gray, who in one case found as many as nine. McCaffrey himself found three cases, in a series of 3,000, with four coils. His statistics go to show that coils are more frequent in multiparae and in right-sided positions.

This case, too, is an interesting example of primary deflexion of the head caused by multiplicity of loops of cord round the neck. Fortunately the small size of the head prevented this from obstructing the normal course of the labour.

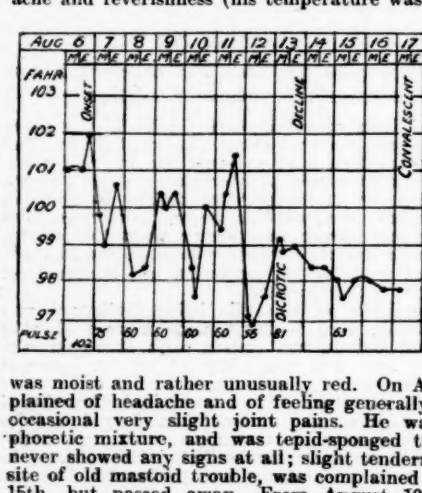
I am indebted to Professor F. J. Browne, Director of the Obstetric Unit of the Hospital, for permission to publish the facts of the case.

S. ZUCKERMAN, M.A.
University College Maternity Hospital, London.

PYREXIA WITHOUT VISCERAL SIGNS.

ATTENTION was called recently by the lay press to the occurrence of a pyrexical illness without involvement of the chest or obvious physical signs.

Late on the evening of August 6th I was called to a public school boy, aged 18, who complained of feeling unwell and of headache and feverishness (his temperature was 102°). The bowels had been open that day; the tongue was very slightly furred, the skin was clammy and moist. There was no abdominal tenderness, and nothing abnormal was detectable in the chest. The respirations were 22; the pulse 102.



He was given two grains of calomel and was directed to take a saline draught in the morning. The effect was good. The tongue cleared up, and for the remainder of the time was moist and rather unusually red. On August 7th he still complained of headache and of feeling generally "rotten," and also of occasional very slight joint pains. He was given a simple diaphoretic mixture, and was tepid-sponged twice a day. The chest never showed any signs at all; slight tenderness behind the ear, the site of old mastoid trouble, was complained of on August 14th and 15th, but passed away. From August 10th onwards he had a salicylate mixture (10 grains) and salol (5 grains), both thrice a day; the course of the disease is shown in the temperature chart. The pulse was dicrotic on August 13th. Convalescence was uneventful.

I am rather inclined to view the case as a slight manifestation of intestinal influenza.

Bickley, Kent. CHARLES A. H. FRANKLIN, M.D.

INVERSION OF THE UTERUS.

As inversion of the uterus, though not rare, is still an uncommon accident (Dr. T. W. Eden states that it is only met with in from 1 to 180,000 to 1 in 200,000 labours) it seems worth while to record the following case.

On July 5th, 1927, I received a form from a midwife to attend a multipara, aged 38 years, for "retained placenta." On arrival I was given a history of normal labour as far as the end of the second stage, when an average female child was delivered. During the third stage the placenta had come away incomplete and the patient had collapsed. Further portions of the placenta and membranes had then come away, but the midwife, feeling a mass in the vagina and observing the state of the patient, decided to obtain medical assistance.

I found the patient with well marked symptoms of shock and almost pulseless. Haemorrhage was only slight. She was conscious, and complained of faintness, but there was no pain. A hypodermic injection of 1 c.cm. adrenaline was immediately given, and brandy and saline by the mouth. On bimanual examination a firm mass was felt low down filling the vagina, and abdominally the absence of the hard fundus and body of the uterus, and in its place the inversion ring, made the diagnosis of almost complete inversion of the uterus apparent.

Under ether anaesthesia an unsuccessful attempt was made to reduce the displacement. The patient was then admitted to the Barry Accident and Surgical Hospital, where she died later in the day from shock. No strenuous efforts were made to expel the placenta, and the cord was of average length, so the condition would appear to have been spontaneous, probably due to atony of the wall of the fundus uteri.

Barry, Glam. J. C. FOTHERINGHAM, M.B., Ch.B.Glasg.

Reviews.

THE PROBLEM OF PLAGUE IN SOUTH AFRICA.

A CONSIDERABLE amount of attention has been directed of late to the subject of plague in South Africa (BRITISH MEDICAL JOURNAL, February 26th and May 14th, 1927), and, indeed, it is a question of importance, not only for South Africa itself, but for all countries having commercial transactions with it, for the effects of plague, commercially or medically, are always felt beyond the confines of the country where it happens at the time to prevail.

A recent publication[1] (No. XX) of the South African Institute for Medical Research comes most opportunely to bring the whole question again before the medical world. This work is the result of the joint efforts of Dr. MITCHELL, the chief health officer for the Union of South Africa, Dr. HARVEY PIRIE, bacteriologist of the Research Division, and Dr. INGRAM, medical entomologist to the Institute. The work forms a complete and up-to-date exposition of the problem from the two aspects of the history of the disease in the country and the reasons for its prevalence. It is divided into eight sections, for all of which, except the first and last, Dr. Harvey Pirie is responsible.

Section I is the most interesting to the generality of people outside South Africa, for it gives a most interesting account of the distribution and prevalence of plague in the Union from the time of its first recorded appearance at the beginning of 1899 (when it was imported from Madagascar to Lourenço Marques and by Delagoa Bay) down to June, 1926. The author of this section, by virtue of his position, put forward in May, 1924, a scheme for a comprehensive investigation involving the organization of a mobile laboratory and a special research staff for work in the field. The results of these investigations are recorded in the remaining sections of the book. Section II contains notes on the various rodents associated with the disease in South Africa, describing their distinctive characters, their ranges of activity, and sketching briefly their habits. Sixteen species of wild rodents are described, of which eight have been found naturally infected. It is the great variety of these that constitutes one of the main difficulties in dealing with the problem. The incidence amongst the human population would doubtless be much more severe than it actually is were it not for the fortunate fact that the species of fleas found on veld rodents very rarely occur on domestic rodents.

In the succeeding section is recorded a series of tests carried out with the view of determining the comparative susceptibilities of the various species of rodents to plague. This is an important piece of work, performed with the care and skill which we have come to expect from the staff of the Research Institute. All proved to be highly susceptible, except the Namaqua gerbille (*Desmodillus auricularis*), a fact which may be of great importance in delaying the spread of plague in the northern and western parts of the Cape Province. The various species of Karroo rats, formerly believed to be relatively immune, proved to be as highly susceptible as the rest; the difference in their habits and their ectoparasites is the reason of their diminished liability to plague. The common gerbille (*Tatera lobengulae*) and the yellow mongoose (*Cynictis penicillata*) occupy the two extremes: the former constituting the chief reservoir of plague on the veld, the latter being extraordinarily resistant to infection.

The question of plague on the veld and its persistence is next taken up, and it is shown that the disease may die down and become for a time quiescent among the rodents, and that certain fleas could infect as long as four months after leaving an infected host. A bacillus, the "Tiger River bacillus," so named from the place of its discovery, and scientifically denominated by the author *Listerella hepatolytica* (which may be identical with *Bacterium monocytogenes* discovered previously by E. G.

[1] *The Plague Problem in South Africa: Historical, Bacteriological, and Entomological Studies.* By J. Alexander Mitchell, M.B., Ch.B.Glasg., D.P.H.Cantab., J. H. Harvey Pirie, B.Sc., M.D.Edin., F.R.C.P.Ed., F.R.S.E., and A. Ingram, M.D.Edin. Publications of the South African Institute for Medical Research, No. XX. Johannesburg: South African Institute for Medical Research. 1927. (7½ × 10½, pp. 85-256; 11 plates.)

Murray at Cambridge), causes a fatal infection among gerbilles, and a certain degree of success is reported from the use of this, on the lines of the Danysz virus, for destruction of plague-carrying rodents.

Section VI is of great practical value, in that the results deduced from animal experiments as to the benefits of prophylactic vaccines and serums tend to show that the sense of security engendered by their use on theoretical grounds rests on an unsure foundation. Of particular interest is Dr. Pirie's statement that mercurochrome proved valueless in his hands for treating plague in guinea-pigs.

The final section, by Dr. Ingram, on the entomological aspect of plague in South Africa, is a detailed record, mostly of field work carried on during 1925-26. An enormous amount was done, and the account of it is given in several subsections. From a practical point of view the chief subjects were the identification of the numerous species of fleas collected from different rodents, experiments to test longevity, others to test the capability of fleas of conveying plague from one rodent to another, and the seasonal prevalence of the commoner fleas caught on veld rodents and those found on house rats in Johannesburg.

The compilation will be of great service in clearing up past misconceptions and in indicating the lines along which this vast and important problem may best be attacked in the future, and all three authors are to be congratulated on a very fertile piece of team work conscientiously performed.

PRESSEYS' "MENTAL ABNORMALITY AND DEFICIENCY."

ILLNESS is a social as well as a medical problem. Particularly is this the case with mental illness, and if mental illness is understood to connote not merely definite psychoses but all serious emotional and intellectual maladjustments and deficiencies it is clear that there is room for a book offering a wide and not too technical or detailed survey of these conditions. Such a book is *Mental Abnormality and Deficiency*,[2] by Professor SIDNEY L. PRESSEY, Ph.D., and LUELLA C. PRESSEY, Ph.D. Neither of the authors possesses a medical qualification, but both are teachers of psychology in the Ohio State University, and have had a rather unusual range of experience in actual work with abnormal and defective children and adults. They have "attempted a treatment which should be of definite practical value to those interested in various special fields of work in which problems of personality and adjustment are frequently met," and their volume should be found of considerable value by social workers, by welfare and business superintendents, by school teachers and administrators and college deans, by police court missionaries and magistrates, and by others who take a more general interest in the special problems dealt with. The newly qualified medical man or woman, too, should find it of service whether the sphere of work contemplated be general practice or the school medical service.

The method of presentation adopted by the authors is largely the case method. The essentials and pitfalls of history taking and the technique of case study are carefully set out. The various main types of mental disease and defect are described; their causes and the methods of dealing with them are discussed; a suggestive chapter on mental hygiene concludes the volume. The writers justly insist upon the wide extent of the problem of mental deficiency, disorder, and disease, even when allowance has been made for that lower average intellectual level and wider variation within the limits of the normal which has come to be recognized in recent years; upon the importance of the "borderland" conditions of the emotionally maladjusted, the emotionally unstable, and the mentally queer; upon the necessity for regarding individual personality and character among those who as a group are called "feeble-minded"; upon the fact that "generalizations in psychiatry are risky and should be applied only with great caution in individual cases"; and upon the real possibility of the prevention of mental illness by careful discipline, training, and social adjustment in early life.

Different portions of the book will appear of greater value than others to different classes of readers; and it must be confessed that to the English medical reader the value of the whole seems less than it should be, by reason of its entirely American outlook and the absence of actual experience of medical practice by its authors. For example, the Mental Deficiency Acts in this country give definitions of the different classes of mentally defective persons which are legal guides of great practical value and are not far from being scientifically acceptable. These are entirely ignored in the volume under review, which adopts instead standards which, however carefully applied, are apt to be misleading both in diagnosis and treatment. They do in fact result in apparently contradictory statements in the text, and in an estimate of the influence of heredity in these cases which most English authorities would hesitate to endorse. Again, there is no mention of the mental effects of lethargic encephalitis, which recent medical practice in this country has shown to be of very great interest and importance. Though this book thus serves to emphasize the desirability of a volume covering similar ground, and written for a similar class of English reader by writers one of whom, at least, should have actual experience of medical practice, this very fact demonstrates how valuable it still is as "an introduction to the study of problems of mental health."

[2] *Mental Abnormality and Deficiency.* By Sidney L. Pressey, Ph.D., and Luella Cole Pressey, Ph.D. London: G. Allen and Unwin, Ltd. 1926. (Extra Post 8vo, pp. xii + 356. 10s. 6d. net.)

A GERMAN CYCLOPAEDIA OF PHYSIOLOGY AND PATHOLOGY.

THE first half of the seventh volume of the *Handbuch der Normalen und Pathologischen Physiologie*[3] contains nineteen articles on the physiology of the heart; they cover a very wide field, for they deal with the physiology of the mammalian heart, with the comparative physiology of vertebrate and invertebrate hearts, with the methods of clinical investigation of the heart, and with heart disease. Certain of the articles are of considerable interest and value. Professor Bethe has written well on the comparative physiology of blood circulation, both in vertebrates and in invertebrates, and Professor Hesse has contributed an article on the variations in size of the vertebrate heart, much of the information in which has been collected for the first time. The article by Professor v. Weizsäcker, on the metabolism of the heart and on its heat formation is of particular interest, as it is very largely based on his own original work. There are articles also on the clinical methods regulating the functional activity of the heart; they include essays by Professor W. Frey, on the apex beat and heart sounds; on the heart size, by Professor Hans Duttler, and on fibrillation, by Professor H. Winterberg. It is impossible to deal fully with a large volume of reference such as this, but in general it may be said that the articles are of a high standard, and that the editors have been fortunate in their choice of contributors.

The eleventh volume of this cyclopaedia deals with "organs of reception." The editors explain that though the older term "sense organs" may be suitable for use in writings on human physiology, yet in a book which includes comparative physiology, any term which bears a subjective implication is objectionable; they have therefore employed a purely objective nomenclature. The volume deals with the following receptor organs: tango-receptors (touch), thermo-receptors, pain, chemo-receptors (taste and smell), phono-receptors (hearing), stato-receptors (vestibular apparatus), and concludes with articles on geotropism in plants and animals and galvanotaxis. Special mention may be made of two articles by Professor R. Magnus of Utrecht on the semicircular canals and otolith apparatus in mammals. These articles have a particular interest and authority because they are very largely founded on the brilliant researches carried out during the last ten years in the author's school.

[3] *Handbuch der Normalen und Pathologischen Physiologie.* Herausgegeben von A. Bethe, G. v. Bergmann, G. Embden, A. Ellinger. Berlin: J. Springer. 1926. (Sup. roy. 8vo. Band VII/I, pp. x + 852; 200 figures; R.M.69. Band XI, pp. xiv + 1062; 236 figures; R.M.81. Band XIV/I, pp. xiii + 1193; 440 figures; R.M.96. Band XVII, pp. xi + 1204; 179 figures; R.M.84.)

The subjects of reproduction, development and growth are treated together in the first half of the fourteenth volume. The first part of the volume contains a series of articles on the physiology of the gonads; and some of the most interesting are those of Professor Knut Sand on castration, the transplantation of the gonads in vertebrates, and the experimental restitution of the gonads in vertebrates. The author, who has worked on these problems for many years, displays a very sceptical attitude regarding rejuvenation by transplantation of the testicles, and emphasizes the fact that even auto-transplants do not last for more than a few months under the most favourable conditions. He points out that the absorption of grafts made from individuals of a different, even though allied, species proceeds much more rapidly. He is more optimistic regarding Steinach's operation (the ligation of the vas deferens), for he states that personal experience for four years of both laboratory and clinical work has greatly modified the position of absolute scepticism which he had at first assumed. He now admits that remarkably beneficial results are undoubtedly produced and even appear to be permanent. The article by Professor Biedl on the action of testicular and ovarian extracts also deserves notice, as he gives a full account of the extensive recent researches on this subject. The editors of this cyclopaedia have in all cases taken a broad view of the subjects to be discussed in it, and hence it is not surprising to find the section on reproduction concluding with a series of articles on sexual psychology. The last quarter of the volume is devoted to the subjects of growth and regeneration of tissues.

Volume xvii deals with correlations within the body, and covers a remarkably wide range of subjects. The first quarter of the book deals with heat regulation and water exchange: articles of particular interest are those on hibernation, by the late Professor L. Adler; on the physiology of water exchange, by Professor R. Siebeck; and on diabetes insipidus, by Professor E. Meyer. In all these instances the authors have extensive first-hand knowledge of the subject, and include in their articles a certain amount of unpublished original work. The next quarter of the volume deals with the action of radiations, light, heat, *x* rays, and radium, together with the effect of climate on health. This section is followed by a few articles on sleep and hypnosis; that by Professor C. v. Economo, on the pathology of sleep, is of outstanding interest. The rest of the volume is filled by articles on old age, death, and heredity.

On the whole, the articles in this cyclopaedia maintain a high standard, but they are open to the criticism that the authors show an undue tendency to confine their attention to German work. A sample count of about 500 consecutive references from half a dozen different articles indicated that about two-thirds of the references were to German work and only one-third to the original work of all the other nations in the world. The narrowness of outlook thus caused is betrayed in several statements we have noted; for example, on page 518 (vol. xvii) the author states: "The ultra-violet rays cure rickets. The manner in which this action is produced is still completely unknown." Apparently the significance of the English and American work on the production of the antirachitic vitamin from cholesterin by means of ultra-violet light is still unknown to German scientists of repute, although it has become popular knowledge in this country. Other similar lapses could be quoted. This tendency to a one-sided view of science is particularly regrettable, and will hinder the cyclopaedia becoming a standard international work of reference in physiology.

IRREGULAR ACTION OF THE HEART.

The work of the Vienna school on cardiac irregularities is well known in this country, and now Professor Wenckebach and Doctor Winterberg have produced a very comprehensive textbook on irregular action of the heart.[4] It was planned originally as a second edition of Professor Wenckebach's earlier volume on the subject, but, owing to the great accumulation of fresh material since 1914, it is in reality a new work. The early pages deal shortly with the special anatomy and physiology, and with the methods now employed for investigating the heart's action in the human subject, particularly the string galvanometer. The remainder of the book is devoted to excellent descriptions of the nature, diagnosis, prognosis, and treatment of the various cardiac irregularities. While full reference is made to the observations of other workers the bulk of the material is drawn from the authors' own experience. The teaching does not depart in any essential from that current in this country; the descriptions are clear and detailed, and the numerous good examples of polygraphic and galvanometric tracings are published in a separate small volume.

It is a good book and should prove very useful, not only to those already acquainted with the subject, but also to those who would enter this interesting and important field of clinical medicine.

[4] *Die Unregelmässige Herztätigkeit.* Von K. F. Wenckebach und Hch. Winterberg. Leipzig: W. Engelmann. 1927. (Sup. roy. 8vo: Textband, pp. vii + 635, 63 figures; Tafelband, 447 figures, 184 plates. M.78.)

KITCHEN CHEMISTRY.

The second volume[5] of *Applied Chemistry* continues on similar lines the studies begun in vol. i. The contents deal with a variety of foods, including milk, fats, carbohydrates, meat extracts, and various beverages; there is a chapter on cooking and another on the calorific value of foods.

The book is designed for students taking the degree of B.Sc. in household and social science. The reason for the choice of title is apparently that applied chemistry is the name given to a scheduled course of study for that degree; but the title is something of a usurpation, for those engaged in chemistry as applied to agriculture, brewing, ceramics, or dyeing have an equal claim to it, to say nothing of manufacturers of chemicals. It appears further that chemistry as applied to household science is not what we had thought. We had expected to learn something of the chemical changes that occur in culinary operations, how these may be brought to the most desirable pitch, and by what mismanagement they may be marred. Very meagre, however, are the references to information of this kind; most of the text is occupied with methods for the discovery of adulteration which properly belong to the laboratory where foods are analysed.

In the chapter on cow's milk little more than a page is given to the recital of what milk is, while more than twenty pages are filled with methods for its analytical examination. We would not demur to this scheme if it appeared to be the best way of teaching the nature of the components of milk, but of that we are not convinced. It may be true—we suspect it is—that not much is known of the chemical laws which govern the transformations in our food; perhaps even the distinction between beef tea and chicken broth is too subtle for chemical discussion. But something, we believe, is known of the constituents of the tea leaf and coffee seed; here surely was a chance to explain chemically what has happened when a cup of tea or coffee is made well or is spoiled.

The chapter on the cooking of food does, we agree, introduce the reader to a consideration of the subject on the lines advocated by us, and perhaps something may yet be evolved from this book as a beginning which shall go further in the direction of real domestic chemistry. For the labour bestowed on the book we have nothing but praise. It contains much useful information on a variety of matters connected with the preparation and manufacture of foodstuffs, and if food analysis is to be a subject for the university degree in household science, the book is just what the student needs.

[5] *Applied Chemistry.* By C. Kenneth Tinkler, D.Sc., F.I.C., and Helen Masters, B.Sc. Vol. II: Foods. London: Crosby, Lockwood and Son. (Demy 8vo, pp. xi + 276; 20 figures, 2 plates. 15s. net.)

NOTES ON BOOKS.

Dr. Tipper, who has spent many years in tropical Africa, where he served in the West African Medical Service, has written a little book (its preface is dated from Hong-Kong in the beginning of this year) in which he describes some of the attractions of the great delta of the Niger River. His book, which has for its title *The Cradle of the World and Cancer: A Disease of Civilization*,[6] is the unfolding of a twofold speculation. These speculations, especially that relating to

[6] *The Cradle of the World and Cancer: A Disease of Civilization.* By Ernest H. Tipper, M.R.C.S.Eng., L.R.C.P.Lond. London: Charles Murray. 1927. (Cr. 8vo, pp. 142. 5s. net.)

cancer, are not altogether new, but Dr. Tipper contrives to give his view of them some local colour. He has been much impressed with the wonder of the great Niger river, and is enthusiastic for the native nobility of its denizens. He counts them amongst the most virile people of the world. From this it is a step to think that this river valley was the cradle of the world, and that all the world of men would have been as these if only the rest had not been sundered by fire, which destroyed the forests and laid a waste of the Sahara between the cradle land and the outer world. "Through that severance," he thinks, "we have lost touch with the first principles of diet, and have floundered about artificially ever since." That original diet he claims to be such as is easily attainable with the simple agriculture of a rich tropic valley—vegetables and palm oil and palm wine. But where would the unfortunate native of the high Arctics get these fine vegetable fats, or even the inhabitants of the isles of Europe, in a fresh and native state? In that valley there is no constipation, and no cancer, except in rare cases where the people have abandoned their natural food for the flesh-pots of the benighted white man. But there is hope even for us—"We tan at Brighton, become copper coloured at the Canaries, and if our impoverished blood permits of it and we become acclimatized, after a few generations at the Equator we too should be black"—and perhaps comely. But in that happy valley there is some use for aperients despite the perfect dietary: "Aperient plants galore he has around him, and need but to pinch off a bit of the fleshy aloe growing by the roadside to effect a remedy." So it is certain one of the plagues of civilization cannot exist in that Eden—the patent pill vendor.

After recovering from an unnecessarily chilling preamble stating that the London County Council accepts no responsibility for the author's opinions or conclusions, the reader will find that Mr. DEELY, in his small book on *Industries and Occupations for the Mentally Defective*,[7] enumerates some forty-five occupations in which he considers the mentally defective can become efficient under trained instructors. They range from simple processes in the making of envelopes, paper bags and needlework, to weaving, dyeing, spinning, and cement kerbing. A short description is written round each, most space being devoted to brushmaking, shoemaking, and weaving. The intention seems to be that all the work should serve the needs of the particular institution or of others controlled by public bodies. The limitations in respect of dangerous processes, as in guillotine cutting of paper or clothes, in the butcher's shop, and in tinsmith's work, are left rather too much to the reader to search out in the descriptions. The medical superintendent of The Manor, Epsom, where the work is carried on, says, in a foreword, that if money could be spent freely on providing suitable workshop accommodation and staff, there is no limit to the useful occupation of many mental defectives in some direction or other. The book might usefully be read by persons in charge of other institutions than those for which precisely it is primarily intended.

The seventh monograph in the French series of volumes on biological problems deals with aspects of the physiology of the myocardium.[8] The author, Professor HENRI FREDERICQ, restricts himself to those questions in which he himself has been interested, and in five chapters reviews recent work on the origin and propagation of the excitation wave and its electrical manifestations in the vertebrate—specially the mammalian—heart. The book consists chiefly of summaries of the observations and views of the many writers quoted, most of which are already known to English workers in this field. A list of nearly 800 bibliographical references is appended.

We have received a copy of *The Insects of Australia and New Zealand*,[9] by Dr. R. J. TILLYARD, who is entomologist and chief of the Biological Department of the Cawthron Institute, Nelson, N.Z. The work, which is intended primarily as a textbook for students of entomology in Australia and New Zealand and secondarily for those who have a general interest in the insect life of these countries, contains thirty chapters. The first four, which are introductory, deal with the classification and census, external morphology, internal morphology, and life history of insects in general. The bulk of the volume is concerned with the various orders of insects, including sections dealing with morphology, life history, distribution, fossil history, economics, and classification, followed by keys to the suborders, superfamilies and families, and accounts of all the families in each order. In the penultimate chapter the fossil record and origin of the Australian and New Zealand insect faunas are discussed, and in the last chapter a brief account is offered of the more important methods for collecting and preserving, and for the scientific study of insects. A glossary of biological and entomological terms is appended. The text is freely interspersed with figures, 203 of which are coloured.

An English edition of *The Early Embryology of the Chick*, by BRADLEY M. PATTEN, has been published in London by John Murray, at the price of 15s. The American edition was reviewed in our issue of November 21st, 1925, p. 957.

The Woodward was the first officer under the Lord Warden, and his duty was to inspect the woods. In this capacity Mr. MARCUS WOODWARD, in his *New Book of Trees*,[10] declines, with Oliver Wendell Holmes, to hold forth in a scientific way about his tree-loves. Instead, he tries to bring out the character and expressions of trees, and to glean the folklore which has gathered round them. Consequently he divides trees according to the locality in which they grow: woodland, hedgerow, park, and seaside and riverside trees, with a separate chapter for conifers. The Londoner may be surprised to find the hornbeam of his Epping Forest described amongst hedgerow trees. Yet, as Mr. Woodward says, no tree, other than evergreens ,makes a better hedge plant. Of the maple we learn that Evelyn, in describing the value set upon the wood by luxurious Romans for their tables, explained that when husbands reproached their wives for extravagance in pearls the wives were wont to retort, and *turn the tables*. Some golfers may not know that the crab-apple was once the wood of woods for club-heads, though it has now been displaced by the American persimmon. Probably few doctors know that pears were considered an antidote to poisonous mushrooms, a reputation which perry still holds. For each tree there is much anecdote and lore in the book; and the text is sprinkled with quotations from the poets and pleasing wood engravings by Mr. Dillon McGurk. Each chapter is prefaced with a short description of the tree.

[7] *Industries and Occupations for the Mentally Defective*. By P. J. Deely, M.I.H., A.R.S.I. Epsom: Birch and Whittington. 1927. (Cr. 8vo, pp. xv + 112; 1 plate. 7s. 6d. net.)

[8] *Aspects Actuels de la Physiologie du Myocardie* (Première Série). Par Henri Fredericq. Les Problèmes Biologiques, VII. Paris: Les Presses Universitaires de France. 1927. (6 × 9¼, pp. viii + 300; 132 figures.)

[9] *The Insects of Australia and New Zealand*. By R. J. Tillyard, M.A., Sc.D.Cantab., D.Sc.Sydney, F.R.S., etc. Sydney: Angus and Robertson, Ltd.; London: The Australian Book Co. 1926. (6 × 9¼, pp. xvi + 560; illustrated.)

[10] *The New Book of Trees*. By Marcus Woodward. London: A. M. Philpot, Ltd. 1926. (Demy 8vo, pp. 310; illustrated. 12s. 6d. net.)

PREPARATIONS AND APPLIANCES.

Temporary Airtight Covers.

A SIMPLE contrivance for covering cups, milk bottles, and small basins temporarily has been sent to us by Acto, Ltd., Tudor Works, East Twickenham. It consists of a sheet of thin rubber supported by a metal ring; when placed over the top of the vessel and its centre depressed by the fingers it adheres, but can easily be removed. It keeps out dust effectively, and is likely to be of use in the sickroom as well as the larder. The cost of these "Vacme" covers, which seems to be rather too high, varies from 6d. to 1s., according to size.

ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the Committee forty-nine cases were considered and £776 10s. 8d. voted to forty-three applicants. The following is a summary of some of the cases relieved.

L.R.C.S.Edin. 1883, aged 72. Through continual ill health applicant and his wife have had to live upon their savings, which are now reduced to £81. They have no children. He has an Epsom pension of £40 and an old age pension of £26. Rent and rates £26. Voted £40 in quarterly payments.

Daughter, aged 56, of M.R.C.S.Eng. who died in 1873. Has a temporary allowance from brother-in-law of 5 guineas a month and pays £4 5s. towards board and room to a widowed sister, and helps in domestic duties. She is now recovering from a severe operation and asks for financial help towards convalescence. Voted £18.

Widow, aged 71, of M.R.C.S.Eng. who died in 1897. She has £76 from investments, and pays 24s. a week for board and lodging. Asks for help to meet incidental expenses. Voted £18 in quarterly instalments.

Widow, aged 57, of M.D. who died in 1924. Her son, trained at horticultural college, has purchased a holding and bungalow, and she was voted £10 towards its furnishing.

Wife, aged 62, of L.R.C.P. who has been in a mental hospital for twenty-four years. Has to support herself by cooking and pay 5s. a week towards the board of her invalid daughter, who lives with married sister. The Fund has paid the husband's life insurance premiums for the past two years; this grant of £9 5s. 8d. has been renewed, and £12 has been sent to the applicant for her own expenses.

Widow, aged 66, of L.R.C.P. who died in 1909; she and her niece have a boarding house, but owing to the bad weather have been unable to let and are now in arrears for rates. Voted £13 as a special grant.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, at 11, Chandos Street, Cavendish Square, London, W.1.

The Royal Medical Benevolent Fund Guild still receives many applications for clothing, especially for coats and skirts for ladies and girls holding secretarial posts, and suits for working boys. The Guild appeals for second-hand clothes and household articles. The gifts should be sent to the Secretary of the Guild, 58, Great Marlborough Street, W.1.

British Medical Journal.

SATURDAY, AUGUST 27TH, 1927.

ALCOHOL AND THE MOTORIST.

During recent years the influence of alcohol on the driving capacity of the motorist has compelled the serious attention of the medical and legal professions, and has brought into prominence the initial difficulty of devising a sound scientific procedure for establishing the presence and defining the degree of intoxication. The British Medical Association, in October, 1925, appointed a special committee "to consider and report on the present tests for 'drunkenness,' with recommendations as to their modification or improvement." The report of this committee, which was published in the Supplement of February 19th, 1927, included an account of the practices and regulations in certain foreign countries, and an examination of the tests in common use in Great Britain to determine the presence of drunkenness, a definition of which was suggested. The committee gave careful consideration to the pioneer work of Drs. Godfrey Carter and Herbert W. Southgate, whose joint paper on the excretion of alcohol in the urine as a guide to alcoholic intoxication was published in our issue of March 13th, 1926 (p. 463). The subject was further discussed by the Section of Forensic Medicine at the Annual Meeting of the British Medical Association at Edinburgh, and a report of the views there expressed appears at page 333. Dr. Godfrey Carter, in the opening paper, called attention to the prevailing lack of uniformity in the judicial decisions in cases of motorists accused of being "drunk," and referred to the attempts of Mellanby and Southgate to find a method of determining the amount of alcohol in the system with a view to guiding courts to correct decisions.

The problem is not new, and ought to give little trouble to the medical witness; many of the so-called difficulties arise from the misunderstanding of the question by medical practitioners. The first stumbling-block is, undoubtedly, the vague use of the word "drunk." The man who is drunk—using the word in the lay sense—presents no difficulty; his condition is obvious, and he is usually arrested before he has caused any damage. In fact, accidents caused by such drivers may almost be neglected in considering this subject from the point of view of medical evidence. The dangerous driver is the man who has dined well with some friends; he is usually a good if not an expert driver who, owing to his exuberance, takes unnecessary risks. Such a man cannot be said to be drunk in the lay sense—indeed, he may only have had a small amount of alcohol; yet he is drunk in the legal sense. A medical witness using the term "drunk" is immediately asked to explain what he understands by it, and is generally unable to give any description which will conform with a jury's conception of a drunken man. To avoid this pitfall many employ the phrase, "under the influence of alcohol," which is also bad, since anyone who has taken any alcohol is under its influence. The difficulty vanishes when it is realized that in this connexion a man is drunk within the legal meaning of the term when he has become so affected by alcohol that his judgement as a driver has become impaired. It makes no difference if, owing to some nervous or other disease, it only required half a glass of whisky to produce this effect or whether half a bottle was consumed: the man is drunk within the legal meaning. It is a matter of common knowledge that it is not merely the amount of alcohol that has been consumed, but also the circumstances, the individual and the environment, the time since the accident, and many other factors, which determine the diagnosis of drunkenness. Such a decision can only be an expression of the personal opinion of the medical practitioner, founded on a general clinical examination and his previous experience of such cases. It is for the court to decide the weight to be attached to any particular doctor's evidence. Not realizing this, many medical witnesses create for themselves further difficulties by elaborating tests, such as walking along a straight line, standing on one foot, or repeating some difficult phrase—feats which some sober persons cannot perform. Anything in the nature of a test can, in almost every case, be ridiculed in cross-examination, after which the evidence of the witness ceases to be of much value to the court.

Conclusions based on determinations of the proportion of alcohol in the blood and urine, to which Dr. Carter's opening paper was largely devoted, are likewise open to serious criticism. Apart from the possible illegality, mentioned by Professor J. T. J. Morrison, of obtaining specimens of urine for examination without the consent, or even without the knowledge, of the accused person, it is undeniable that certain types of individuals give fallacious results. There is the difficulty of obtaining the specimen, and the fact that, even if an analysis should indicate the amount of alcohol consumed, the effects on different persons vary to such an enormous extent with the individual and the environment, both in the amount of alcohol required and in the type of effect produced, that little can be deduced from such an examination other than that a definite amount of alcohol has been imbibed—a fact which may be discovered more readily by other means. The speed with which a man can react to a stimulus, such as the sight of an approaching obstacle, and the correctness of his response, are admittedly variable in different persons, and in the same man at different times; it is not likely that the modification of this response by alcoholic poisoning of slight degree is constant for humanity as a whole. It would seem to follow that the percentage of alcohol in the body fluids is not necessarily a reliable index of the resulting degree of intoxication.

The offence of driving a car while the judgement is affected by alcohol, whether or no the contributing factor of disease is present, is a serious one, and merits severe punishment. In Denmark the question has been carefully studied; details of the medical examination made in that country were published in an appendix to the report of the committee of the British Medical Association. Briefly, it may be said that this examination lasts about three-quarters of an hour, and practically consists of a general clinical examination; urine and blood tests have been considered and discarded. The accused person is described as intoxicated, slightly under the influence of liquor, or sober. On conviction a driver forfeits his licence for life. This punishment is very drastic, and with a penalty so severe there must be a tendency on the part of the court to hesitate to convict. Although this question of punishment is beyond our province, it serves to emphasize the responsibilities of the medical practitioner in these cases, and is a reminder that a diagnosis of drunkenness must not be given lightly.

A TREATMENT FOR ASTHMA.

THE work of Freeman at St. Mary's on the cutaneous reactions obtained with extracts of pollen in patients subject to hay fever had received comparatively little notice when Walker of Boston began his investigations on the similar reactions obtained with other proteins in asthmatics. The early expectations that a new era in the investigation and treatment of asthma had dawned were not fulfilled, as with very few exceptions later investigators failed to confirm Walker's results. Amongst the visitors to his laboratory in the summer of 1919 was Professor Storm van Leeuwen. He also, when he tested the principle clinically, was able to obtain the positive results claimed by Walker only in a very small percentage of cases. Recognizing, however, the importance of the theoretical basis of Walker's work, he continued it in other directions. It is the result of these investigations which he has summarized in his article in this issue (p. 344).

There can be no doubt that he has discovered a very important exciting cause of asthma in the moulds which occur so extensively in house dust and elsewhere. A curious contradiction, however, presents itself for explanation. Whereas Mr. Frank Coke, almost the only writer in England who still has an undiminished faith in the value of cutaneous reactions, advises the use of kapok in pillows to replace the feathers to which he believes many asthmatics are sensitive, Professor Storm van Leeuwen finds that *Aspergillus fumigatus*, which flourishes extensively in kapok, is one of the chief causes of asthma in Holland, where the majority of mattresses are stuffed with this material. As, however, in the Swiss mountains, where almost all asthmatics are free from symptoms, both feather and kapok pillows can be used with impunity, a doubt whether either is really of any importance as an exciting cause of asthma seems not unreasonable.

The results of the practical application of Professor Storm van Leeuwen's views in the form of his allergen-free air chambers requires careful consideration. The fact that cacti are the only plants which can live in rooms of this kind makes one wonder if, after all, the atmosphere can be a healthy one for human beings, whether asthmatic or not. Moreover, it is the experience of every physician that the large majority of asthmatics get well directly they are admitted to hospital: the proportion cannot be much different from that given by Professor Storm van Leeuwen for patients admitted to his clinic. There is nothing peculiar about a hospital in this connexion, as any change—sometimes even, as Trousseau long ago pointed out, to another house in the same street—may be enough to give temporary freedom from attacks to most people suffering from asthma.

Still more important is the fact that the freedom from attacks which follows almost any form of treatment—whether cauterization of the nose (Francis), desensitization to certain proteins (Walker, Coke), diet (Allen), a "cure" at Mont Dore, a visit to the Alps, or allergen-free rooms (S. van Leeuwen)—is very different from a cure. The asthmatic constitution remains, and with it the tendency to asthma.

Still, any means of avoiding attacks is welcome, for, as has been said, the only cure for asthma is not to get it, and, if Professor Storm van Leeuwen's investigations prove that the moulds in house dust are yet another factor which can be dealt with, he will have earned the gratitude of every asthmatic.

As will be seen, Professor Storm van Leeuwen is sanguine that his method may be of use in the treatment of pulmonary tuberculosis. The clinical facts he has to present are few in number, although no doubt carefully observed and recorded, and the theory by which he would account for the improvement he has observed in a certain number of cases is not very clearly expressed. Apparently he would attribute it to the removal of the additional irritation due to the climatic allergens.

APPROVED SOCIETIES AND CLINICS.

THE actions of approved societies in connexion with those "additional benefits" under the National Health Insurance Acts which are commonly known as "treatment benefits" require to be carefully watched. It is important to note that these benefits consist not in the provision of treatment, services, or appliances, but in the payment of the whole or part of their cost. The legal position is held to be that so long as any additional benefit involves mere payment of money it is not "in the nature of medical benefit," and may therefore be administered by an approved society; but that if anything beyond this mere money payment is involved (such as the provision of particular doctors, or the establishment or administration of a service) then the benefit would become "in the nature of medical benefit," and, statutorily, would have to be administered by Insurance Committees or whatever bodies may be made responsible for the administration of medical benefit. It is clearly a departure from the spirit of the Acts, and even yet it may possibly be held to be contradictory to their meaning, that when these contributions of money go directly to secure service of a medical nature they should nevertheless be administered by the approved societies. The dividing line may with some ingenuity and care be respected in words, but in practice it may very easily be obliterated or overstepped. In these circumstances certain of the approved societies, in order to secure for themselves more freedom and power, and having no doubt honestly persuaded themselves that it was in the interest of their members, adopted what may, without offence, be called the dodge of creating a new society purporting to be a "charitable institution," under their own auspices and controlled by their own officials, to which they could make money payments, but which might be free to do what the societies as such could not do—namely, appoint and dismiss doctors, set up clinics, or provide treatment for their members in any way that might seem to them fit. There is grave doubt whether such a society is, in law, a "charitable institution" and whether it can legally perform the functions assigned to it. Indeed, so grave is the doubt and so important the issue that a legal decision on the matter ought to be secured without placing the onus of securing it upon private societies and private funds. It may even yet become essential to secure such a decision, but the necessity would be avoided if the policy desired and aimed at by the medical profession and endorsed by the Royal Commission on National Health Insurance were adopted—the taking of these treatment benefits out of the category of additional benefits altogether and transforming them into normal statutory benefits. This would be accomplished by setting up a consultant and specialist service with laboratory facilities, as strongly recommended by the Royal Commission and urged by the British Medical Association. The

idea of establishing such a service has, however, been abandoned by the Government owing to the persistent objection and obstruction of approved societies.

It is not unnatural, therefore, that recent announcements and indications of the action of approved societies, whether open or camouflaged in the way described, should be viewed with a certain amount of suspicion. It is stated, for instance, that "arrangements have been made by some of the largest of the approved societies to establish a central dental clinic in London, and it is hoped that this institution will be opened before the end of the year. The societies have no power to expend their funds on the building and equipment of a dental clinic, but an organization with which the societies are associated has made itself responsible for the undertaking." The plan of establishing one large clinic for the whole of a place like London is certainly open to criticism on several grounds; the auspices under which it is to be established are not the most desirable in the public interest; and the arrangements in accordance with which it is to be organized and conducted are of the first importance professionally. These things are primarily the concern of the dental profession, but a desire to place medical experience in matters not wholly irrelevant at the disposal of others, and the possibility of the establishment of conditions medically undesirable, which hereafter may by some be held to be applicable to clinics other than dental, justify a word of warning.

The nearest analogue is that which is known as "ophthalmic benefit." The arrangements with regard to this benefit have not been working with complete satisfaction. On the one hand some of the approved societies have been finding it expensive, and on the other insurance practitioners can never consent to cover the unqualified practice of opticians, mainly because this may constitute a grave danger to their patients. These objections should be sympathetically considered on both sides. We believe the seriousness of the latter is recognized by the majority of the larger approved societies, and certainly the medical profession should do whatever it can to meet the former. The British Medical Association has always held that these treatment benefits should be conducted as far as possible on the lines of private practice, that the general practitioner should recommend, that there should be choice of consultant or specialist, and that the consultation should take place either at the rooms of the specialist or, if necessary, at the home of the patient. So far as the profession is concerned, these are the arrangements at present authorized for ophthalmic benefit, a reduced fee being charged to insured persons. It is not beyond the bounds of possibility that this reduced fee might be further modified in some way in order to meet the point of cost; but it is not unlikely that in certain circumstances some arrangement on the lines of a clinic might be found economical and convenient. A few ophthalmic clinics have been set up by "an organization with which the societies are associated," and an extension of these is talked of. The Representative Body at Edinburgh, on the recommendation of the Council, approved "the principle of providing ophthalmic benefit through clinics in large centres" (that is, of population) "as an arrangement auxiliary to the existing scheme of attendance by ophthalmic surgeons privately, subject to the arrangements under which such clinics are established being approved by the Council." The qualifying phrases of this resolution are important—are, indeed, of the essence of the matter. The present arrangement is not to be abandoned but helped; and the conditions under which the auxiliary clinics may be established are to be the subject of careful consideration before they can be approved. Such consideration will no doubt be given at an early date by the Committees advising the Council of the Association, and by the Council itself. The matter is one of some difficulty; but it is clear that neither the auspices under which, nor the conditions in accordance with which, the London dental clinic is to be established can be taken as applying to any ophthalmic clinics which may be in contemplation.

THE FINANCIAL AMNESIA OF MOTORISTS.

A SOMEWHAT complicated discussion has been carried on lately in the correspondence columns of the *Times* under the heading "Motorists and doctors' fees." The ball was opened by a medical man who signed himself "Hireworthiness"; he complained that private practitioners hardly ever received a fee for their services in rendering aid to persons injured in motor accidents. He made the ingenious suggestion that every motorist should be compelled, when paying his licence, to purchase a voucher for a guinea. In the event of injury while driving, the motorist would hand over the voucher to the doctor who attended him or his passenger, and the doctor would subsequently cash the voucher at the post office, while the motorist would purchase another. Unfortunately, "Hireworthiness" proceeded to enlarge this simple proposition by raising the question whether a guinea would be sufficient recompense for treatment at a voluntary hospital, so that the discussion became discursive. Another writer revived the old proposal that every motorist should be compelled to insure against accidents, and that the insurance company should pay all medical fees. A third correspondent, Mr. Graham W. Thompson, was shocked to learn that motorists, as a class, habitually failed to pay for medical services, although in most cases medical charges were recouped up to a certain amount by the insurance companies. The facts of the matter seem to be as follows. The majority of motorists have motor policies. The majority of insurance companies include medical expenses in their policies without additional premium, and the driver may claim medical expenses for himself or for any passenger carried in the car. The amount allowed as medical expenses varies with different companies—from ten guineas to twenty, or even twenty-five guineas. Consequently in a large number of cases all the doctor called to a motor accident has to do is to send in a bill to the owner of the car and see that it is paid. His fee will be part of the claim made by the motorist on his insurance company. In a minority of cases the motorist may be uninsured.. The question of compulsory insurance against injury sustained through motor vehicles has, we believe, been before the Ministry of Transport. Two arguments have been used against the proposal. The first is that compulsory insurance may tend to make the motorist less careful. The second, and perhaps more important, reason is that compulsory insurance for the motorist implies that someone must be compelled to insure him, however undesirable he may be. At present a company can refuse to renew a policy. It remains to be seen whether these arguments can be disposed of, and some scheme of insurance evolved which will neither force undesirables on the insurance companies nor necessitate the State undertaking insurance. This leads up to the consideration of the question of what should be done about injury to a third party—the wayfarer who is neither driving nor is a passenger in the motor car. No insurance company takes cognizance of such a person unless he is able to establish legally a claim for damages against the motorist. There is no doubt that compensa-

tion is sometimes paid without definite evidence of liability on the part of the motorist. The insurance companies may consider that, as a purely commercial proposition, it may be cheaper to pay a reasonable amount than to defend a claim, possibly unsuccessfully, and if successful find even the costs not recoverable. If, however, an action is brought against the driver, and the injured person fails to prove negligence, the doctor who renders aid must trust to the honour of the third party for his fees, or else sue him. It seems that at present the only way in which the medical practitioner can be more certain of receiving remuneration for his services in motor accidents is by collecting his fee on the spot. The alternative of asking insurance companies to pay the doctor direct, whenever they admit liability for medical charges, might be raised with the companies, but would probably be regarded by them as unacceptable.

THE CONSTITUTIONAL FACTOR IN DISEASE.

No two men are exactly alike, however similar they may appear to be; on the other hand, a man may display some marked predisposition, in which case we regard him as having a particular "constitution." As to what such a constitution is apart from its pathological manifestations, and how it arises, is generally regarded as obscure; it suffices to know that a man with a "gouty constitution," though not suffering from gout, is liable to do so. But it is worth while knowing what constitution itself is, and the subject has recently been discussed in our pages with all his customary lucidity by Dr. A. F. Hurst, but a monograph published this year by Professor O. Naegeli on the doctrine of constitution[1] is helpful, although he takes a great many pages to show how recent advances in biological science have enlarged our knowledge of the subject. These advances have in the main been in the domains of botany and zoology, and Professor Naegeli takes occasion to deplore the continued divorce of medicine from these sciences as hindering progress in this particular line. The possession of a distinctive constitution connotes a variation from the average, and the study of constitution involves a classification of the different types of variability and the discovery of their causes. Naegeli expounds the subject on these lines. He in the first place separates spurious from true variation; many species reckoned separate under the Linnean system of classification are now considered to be in reality groups of distinct species differing by comparatively small details, formerly regarded as variations only. Small-pox affords an example of spurious variation. An epidemic of small-pox occurred in Canton Zürich in 1921 which was characterized by its extreme mildness; the symptoms, though typical in the main, were slight, and the mortality was almost nothing. Some constitutional variation, either in the patient or the virus, might have been assumed to account for the character of the epidemic. Investigation, however, revealed certain differences—in the blood cells, for example. The epidemic, Naegeli thinks, started in Brazil, and travelled by way of the United States and England to Switzerland, retaining its characters under these varying conditions. For it he proposes yet another new name, "variola nova," and thinks it is probably a species distinct from true small-pox, with its own virus; that is as it may be—time alone will prove. Of true variation Naegeli recognizes two classes—modification and mutation. Of the former, which is usually the result of some change in the external conditions, he finds a good example in the gradual change of physiognomy exhibited by Europeans after their settlement in America; pathology, he thinks, affords many instances, such as the immunity conferred by infective diseases. Mutation, on the other hand, is the sudden appearance of a new character in the organism, independent of external conditions and transmissible to the offspring. No better example could be given than that of the copper beech. In Switzerland and South Germany all trees showing this variation are derived from one which made its appearance for the first time in the year 1190, the colour being at the time attributed to the blood of a murdered knight. Of pathological examples Naegeli gives a long list—haemophilia, Friedreich's disease, alkaptonuria, hypertension, Huntington's chorea, achondroplasia, multiple exostoses, and many others. In addition to these two types of true variation, we have also to reckon with the innumerable peculiarities of form and constitution which may result from the mixture of races through hybridization, and, further, the modifications of the organism arising from influences exerted directly on the ovum by germinal induction. As an example of the latter the thyroid gland is quoted. Observations made in goitrous districts were held to show that the thyroid glands of newborn children contained no colloid, and this was erroneously supposed to be the normal condition. Apparently, however, all of these glands were abnormal, since by the adoption of a suitable iodine therapy colloid was found present at birth. For many years the direct causes of disease have chiefly attracted attention, to the comparative neglect of the study of constitution, but the latter is again arousing interest, and Professor Naegeli in his monograph helps us to see how the subject should be approached.

[1] *Allegemeine Konstitutionslehre.* Von O. Naegeli. Berlin: J. Springer. 1927. (6½ × 9½, pp. v + 118; 14 figures. R.M.9.60.)

MYELOTOXIC SERUMS.

LEUCOCYTIC serums have already been made the subject of study by Bunting, Flexner, Besredka, and others, and more recently Gustaf Lindström has taken up their investigation with a view to obtaining a more potent serum and of testing their effect in cases of leukaemia in the human subject. His results are recorded in Supplement XXII of the *Acta Medica Scandinavica* in a paper written in English, and entitled "An experimental study of myelotoxic sera." He experimented with three different serums: (1) obtained by immunizing sheep with an extract of rabbit leucocytes, (2) by using washed leucocytes instead of an extract, and (3) by immunizing rabbits with cat leucocytes. The potency increased in this order, and with the size of the dose administered; serum (1) was discarded as being too inactive. Small and moderate doses of serum (2) caused an initial reduction of the leucocytes followed by a marked increase, and a repetition of the dose produced a further fall followed by a rise. If now a large dose were given a more definite reduction occurred; the polymorphonuclear cells disappeared from the blood stream, the mononuclear cells remaining unaffected. A similar experiment with serum (3) showed a very powerful effect, the leucocytes, normally 8,000 per cubic millimetre, being reduced to 50; here again the remaining cells were almost all large mononuclears. Other experiments were carried out to show the effect of repeated small doses. In the experiments on man an immune rabbit serum was employed. The antigen was obtained by drawing off blood from a leukaemic patient into a solution of sodium citrate; the separated blood corpuscles were repeatedly centrifugalized and washed, and the leucocytes separated from the red cells by sedimentation; the leucocytes were then injected into rabbits intraperitoneally. Ten cases of myeloid leukaemia were operated upon, and the technique, results of the injections, symptoms, and course of the disease are set out at length. The general therapeutic results may be gathered from the following summaries. In Case 1 leukaemia was fully developed, with moderate anaemia; it was treated for about twenty months, with some relief from *x* rays and arsenic; when these failed to produce any effect two serum injections were given, and were followed by a complete remission lasting several months; the patient, however,

died at the end of thirty-four months. Case II, after being under observation for three weeks, appeared to be almost moribund; an injection given at this time caused a marked remission, so that within a fortnight the patient was apparently well; the improvement was not maintained, and in spite of two further injections and treatment with *x* rays and arsenic, death occurred within three months. Case III was an ordinary case of leukaemia with good general condition, treated, apparently with some relief, with *x* rays and seven injections of serum during a period of over two years; towards the end there were signs of failing strength, but the general condition was good when the patient passed out of observation. Case IV was a typical example of leukaemia with good general condition, and was considerably benefited by a course of *x* rays; later, however, severe anaemia developed, three injections of serum failed to relieve, and death occurred within six months from the onset of treatment. Case V was only under observation for five months, but during that time considerable improvement under serum injections and *x* rays was noted. Case VI was an instance of leukaemia in a relatively favourable stage; considerable benefit followed *x*-ray treatment (and a single injection), and continued off and on for two years and a half, when its efficacy failed; the patient's condition became unsatisfactory, and a serum injection was followed by signs of intoxication and death. Case VII, with fully developed leukaemia, was under observation for nearly two years; a high leucocyte count was markedly reduced under the combined influence of serum and *x* rays, and with alternate courses of *x* rays and injections the condition remained stationary up to the time of discharge. Case VIII was that of a patient who was in a relatively good condition in April, but seriously worse in October, when two injections were given, the second of which caused death from intoxication. In Case IX the patient was not in a satisfactory condition; a serum injection rendered matters worse, and a second injection a week later caused death from intoxication. The serum used in Case X appears to have been too weak to produce any definite effect.

SARCOMA OF BONE.

In 1920 the American College of Surgeons established a registry, under the charge of Dr. E. A. Codman, to make a collective study of the primary and malignant bone tumours, and to accumulate data whereby the pathology of these conditions might be defined and the value of various therapeutic measures estimated. The April issue of *Surgery, Gynecology, and Obstetrics*, which is the official journal of the American College of Surgeons, appears in two parts; the first of these is entirely devoted to a report by Dr. A. Kolodny, of Iowa University, of a personal study of 700 cases of bone sarcoma collected by the registry, together with a critical analysis of a classification suggested by the registry committee. Eight main groups of bone lesions were formed: (1) metastatic tumours primary in tissues other than bone; (2) periosteal fibrosarcoma; (3) benign and malignant osteogenic tumours; (4) inflammatory conditions; (5) benign giant-cell tumours; (6) benign and malignant angeiomata; (7) Ewing's tumour; and (8) myeloma. Kolodny considers that it would be preferable to place all primary malignant bone tumours in four groups —namely, osteogenic sarcoma, Ewing's sarcoma, myeloma, and a small collection of unclassified sarcomata. He thinks that at present further subdivision of these four groups is unwise, and that the proposed classification supplies sufficient aid in the recognition of the nature of any bony neoplasm, and the decision as to the extent of surgical intervention which may be required. The registry classification recognizes four anatomical types of osteogenic sarcoma—namely, the periosteal, the medullary and subperiosteal, the sclerosing, and the telangiectatic. Codman doubts the advisability of this differentiation, but Ewing approves it on the ground that these types appear to differ from each other as regards their gross anatomy, histology, and clinical course. The main part of Kolodny's essay, however, consists of a close detailed examination of the four groups of malignant bone tumours defined by him. The term "osteogenic sarcoma," suggested by Ewing, includes mainly the lesions hitherto known as periosteal bone sarcoma, a description which ignores or denies the reputed origin of this growth from the precursors of the osteoblasts. Kolodny does not agree with the more recently expressed French view that these tumours are sarcomata of the cellular elements of the collective tissue in the bone and marrow. He also objects to basing subdivision of osteogenic sarcoma on the character of the malignant cells. He denies that round cells occur, and states that the cell most frequently encountered is small and spindle-shaped, with a hyperchromatic nucleus. The chief morphological difference between osteogenic sarcoma and other malignant tumours is said to be its intercellular substance, which may be hyaline, osteoid, cartilaginous, myxomatous, or osseous. The most striking feature in the history and clinical course of Ewing's sarcoma is its appearance in young persons (less than 21 years old) as a consequence of trauma, so that osteomyelitis is suspected at first. Metastasis to other bones is common, and this, together with the response, usually rapid, to radiation, distinguishes it from osteogenic sarcoma; it, however, tends to recur, and gradually becomes refractory to further radiation. Myeloma is a bone-marrow tumour characterized by its incidence after the age of 40, multiplicity of involvement, rarity of pulmonary metastases, and partiality for the ribs, sternum, vertebrae, and spine. It is seldom recognized before extreme skeletal involvement occurs, owing to its infrequency and the difficulty in early diagnosis. Local growths disappear rapidly under radiation, but no permanent recovery is recorded as having followed this treatment. The unclassified group includes angio-endothelioma and extraperiosteal sarcoma.

METABOLISM OF NERVES.

The recent work of Downing, Gerard, and Hill, amplified by Gerard in the *Journal of Physiology*, dealing with metabolic changes accompanying the passage of impulses along peripheral nerve, has removed some of the mystery attached to the activity of nervous tissue. It has long been realized that the nerve is not an entirely passive agent in the transmission of an impulse, since an electrical change (action current) occurs in the nerve when it is stimulated; a nerve killed by asphyxia no longer conducts an impulse. Definite evidence of gaseous exchange, and particularly of any heat production as the result of activity, has proved exceedingly difficult to obtain. This is due largely to the difficulty of making small enough measurements. The work of Tashiro, Parker, and others showed that peripheral nerve produced carbon dioxide, particularly during activity. By the use of very sensitive apparatus, in which the minute amount of heat produced by the nerve is magnified by a thermal relay, Gerard, Hill, and their co-workers have now been able to show that heat is indeed produced when a nervous impulse passes, and that during ten to fifteen minutes after the impulse has passed recovery of some description takes place, accompanied by a further and much larger heat production; this production is ten times as large. In order that the heat produced may be measurably great, it is necessary to stimulate many times a second, but by calculation it can be found that the amount of heat produced by one impulse is one millionth of a calorie per gram of nerve. We are thus faced with the extraordinary fact that the energy used by the contracting muscle is about one million times as

great as that involved in the nervous impulse which causes the contraction. These observations tend to prove that, in some respects, the metabolism of nervous tissue is far more like that of other tissues than was at one time believed. For instance, careful measurements of the oxygen uptake show that more oxygen is needed when the nerve is active than when it is at rest, and by calculation it is found that the ordinary foodstuffs of the body—fat, protein, and carbohydrate—are used by peripheral nerves. The utilization of glucose has also been demonstrated by chemical estimations. The facts we have endeavoured to set out in this paragraph are highly technical, but they have been noted because it seems likely that in the long run they will prove most important to the neurologist, since they deal with the fundamental facts of nervous activity.

"LIFE EXTENSION" IN AMERICA.

THAT a periodic overhaul of the middle-aged is, like the regular visit to the dentist, a wise measure of preventive medicine is too obvious to need much argument. With the spirit of practical application so characteristic of the New World, this method of prolonging life has been put on a basis of mass production in America, and, in his address on "Lengthening of human life in retrospect and prospect," a documented argument in favour of the plan has been put forward by Irving Fisher, professor of economics at Yale.[1] In 1914 the Life Extension Institute was established with the co-operation of the late General W. C. Gorgas, ex-President Taft, and others, one of its objects being to "harness up the profit-making motive of the life insurance companies with the task of lengthening human life." The experience of the Metropolitan Life Insurance Company in providing their clients with medical surveys was so remarkable that it evoked incredulity from its medical and statistical departments; but careful investigation proved that after spending 60,000 dollars on the medical examination of 6,000 of their insured persons in six years, the company had gained 120,000 dollars through the premiums of insured persons whose lives had been prolonged; in other words, the company had made 100 per cent. profit on the investment of 60,000 dollars. One of the chief points brought out by the Life Extension Institute was the enormous extent of unfelt disease, or, as it has been called, "silent sickness"; thus, in an attempt to ascertain the influence of focal infections, examination of many thousands of insured persons showed it to be so prevalent that it was not possible to obtain a group of non-infected persons as controls. The effect of the periodic examinations has been to stimulate and guide the half-million examined in the paths of personal hygiene; for example, many found to be over weight had succeeded in correcting this by the next visit. The favourable results obtained by the Metropolitan Life have been confirmed by those of the Guardian Life and Postal Life Companies. That persons thus examined are thereby benefited is beyond doubt, but it is open to question whether or not the Life Extension Institute is the best machinery for making these examinations. No doubt it makes for consistency, but it lacks the knowledge of the individual which the regular medical attendant can alone supply.

TRIAL BY BATTEL.

THE case of Abraham Thornton, heard in 1817, was remarkable in several respects, and led to an alteration of the law; a certain curious interest therefore attaches to the full report which has been published in the series of Notable British Trials.[2] It was the last case in this country in which a man who had previously been pronounced "Not guilty" by a jury was retried on the same charge; and it was the last in which the defence in such an appeal consisted of the assertion of the right to decide the question by personal combat. In addition the case has some medico-legal interest, and is a striking example of the ability of a jury, when directed by a sound judge, to disregard the violent prejudices of the countryside and to return a verdict in accordance with the evidence. Thornton was accused of rape and murder. He pleaded "Not guilty" to both charges, but he admitted having had carnal knowledge of the deceased, during a night spent in the fields with her after a rustic ball, but he alleged that it was with her consent. The evidence showed that she was seen well and cheerful at a later hour than any at which he could have been in her company. The girl's body was found in a deep pool, into which she might by accident have slipped. According to ancient law the heir-at-law of the alleged murdered person could lodge an appeal of murder "within a year and a day of the completion of the felony by the death; and the plea of *autrefois acquit* on an indictment was no bar to the prosecuting of such an appeal." Unless the evidence of guilt was overwhelming the accused person could demand trial "by battel." This is what Thornton did. Drawing one of a pair of specially made fingerless gloves on his left hand, he flung its fellow on the floor of the court, saying "Not guilty, and I am ready to defend the same with my body!" As Thornton was a strong man and the appellant a weakling, the gage was not taken up, and as there was no strong case against him he was allowed to plead his previous acquittal and was discharged. Popular feeling was, however, still fierce against him, and he was so persecuted that he thought it best to leave the country. Even this proved difficult. According to Arris's *Birmingham Gazette*, the other passengers in the ship *Independence*, bound for New York, refused to go in the same vessel with him, but he managed to cross the Atlantic in another ship. In 1819 an Act of Parliament was passed abolishing trials by "battel" and appeals of murder, and henceforward no one in this country could be tried a second time on a charge of which a jury had already acquitted him.

AWARD OF THE LUCIAN HOWE MEDAL TO MR. PRIESTLEY SMITH.

THE American Ophthalmological Society, the oldest in America, at its congress in Quebec unanimously awarded the Lucian Howe Medal to Mr. Priestley Smith, and commissioned Dr. W. H. Wilder to present it personally. On August 18th Dr. Wilder visited Mr. Priestley Smith at Birmingham, and gave him the beautiful gold cross. He spent some time with our distinguished colleague, examining his wonderful injections of the eye of the ox, and studying the apparatus with which Mr. Priestley Smith is carrying on his investigations regarding the circulation of the eye. The Lucian Howe Medal is awarded at infrequent intervals, and has now been given four times. The first recipient was Dr. Kohler of Vienna, who introduced the use of cocaine into the surgery of the eye. The second was Professor Fuchs of Vienna, and the third Dr. Edward Jackson, editor of the *American Journal of Ophthalmology* and one of the most inspiring teachers in America. We congratulate Mr. Priestley Smith upon receiving the greatest honour which the American Ophthalmological Society can bestow.

WE mentioned last week that Mr. Alban Doran, F.R.C.S., had recently undergone an operation for glaucoma and was a patient in St. Bartholomew's Hospital. We regret now to have to announce that he died on August 23rd; he was in his 78th year.

[1] Fisher, I.: *Amer. Journ. Public Health*, January, 1927.
[2] *Trial of Abraham Thornton.* Edited by Sir John Hall, Bt. Notable British Trials. Edinburgh and London: William Hodge and Co., Ltd. 1926. 10s. 6d. net.

THE YEAR'S WORK OF THE METROPOLITAN ASYLUMS BOARD.

The Metropolitan Asylums Board is a body with large functions of which the general public has only a vague idea. Many people imagine from its title that its main work is in connexion with mental cases, whereas that is only one branch, and not the largest, of its activities. The Board serves an area of over 120 square miles and a population of 4,500,000. From its annual report for 1926-27, a volume of more than 400 pages, it appears that its own daily population of patients and other dependants and staff throughout the year averages about 28,000, and its property, exclusive of its nine casual wards, covers close upon 2,000 acres, or about the area of Richmond Park. It has 15 hospitals for cases of infectious disease, 10 institutions for tuberculosis, 6 for mental cases, 5 for sick or convalescent children, not to speak of its provision for the destitute poor or of its ambulance service, with 150 vehicles, which last year covered more than a million miles in the conveyance of the sick. The Board's medical and dispensing staff consists of 161 permanent and 13 temporary officers, and its nursing staff numbers 4,300. Its annual expenditure amounts to £2,213,000, of which £647,000 is spent on the care of imbeciles and the feeble-minded, and £888,000 on the treatment and control of infectious diseases.

Infectious Diseases.

The number of cases of infectious disease admitted to the Board's hospitals during 1926 was 30,403, higher by some 1,500 than the year before, but the number of deaths was smaller (1,036, as compared with 1,061). The following table has been extracted from the multitude of figures furnished:

Diseases.	Remaining, Jan., 1926.	Admissions, 1926.	Discharged Recovered.	Deaths, 1926.	Admissions, 1925.	Deaths, 1925.
Diphtheria	1,952	10,527	9,851	510	9,247	458
Diphtheria (bacteriological) ...	130	1,108	1,074	14	1,004	4
Enteric fever	19	178	186	3	137	13
Measles	640	2,959	3,364	223	1,902	121
Scarlet fever	2,003	10,653	10,761	88	10,508	111
Whooping-cough	53	775	448	59	1,483	219

The case mortality from diphtheria (4.88 per cent.), and also from scarlet fever (0.8 per cent.), was the lowest recorded. The question of the accommodation to be assigned respectively to measles and scarlet fever has been exercising the mind of the Board, and it has now been agreed that, in view of the higher mortality from measles (6.81 per cent.) and its greater destructive effect on child life, the practice hitherto followed of always admitting scarlet fever cases in preference to measles should be given up, and that there should be a definite allocation of beds to these two diseases. So long as an ample margin of beds remains, cases of scarlet fever or of measles will be admitted as at present on doctors' certificates, but if a shortage of beds becomes imminent, any person desiring the admission of a case either of scarlet fever or measles will be referred to the medical officer of health, who will select the cases which in his opinion should be admitted, having regard to all the circumstances, especially the age and home conditions of the patient. The chief medical officer of the Infectious Hospitals Service, Dr. F. H. Thomson, points out that although scarlet fever is now very mild in this and in many countries, it is not so in all. In Poland and Roumania the case mortality is over 10 per cent., and in Bulgaria over 18 per cent. Moreover, the history of scarlet fever shows that there have been great variations in respect to mortality. It is true that the case mortality in the hospitals of the Board has been under 5 per cent. for more than thirty years, and 2 per cent. or under for the last sixteen years, but scarlet fever, according to the accounts of Bretonneau in France and Graves in Ireland, was a mild disease in the early part of the nineteenth century, and so remained for twenty-five years or more, after which it again assumed a grave form.

Of other diseases for which the Board makes provision in the infectious diseases hospitals, cerebro-spinal fever accounted for only 17 admissions (9 deaths) in 1926; encephalitis lethargica for 21 admissions (7 deaths), poliomyelitis for 13 admissions (1 death), puerperal pyrexia and puerperal fever for 140 admissions (19 deaths), and zymotic enteritis for 12 admissions (2 deaths). There appears to be no reference to the experiment started in 1925 of concentrating puerperal fever patients in two or three hospitals and appointing a visiting obstetric consultant. In the last annual report the hope was expressed that after another year's work much information with regard to the infecting organisms and other matters might be elicited. Small-pox was the cause of only 5 admissions to the special hospitals in 1926, and there was 1 death. The infection was brought from Paris to London on two occasions during the year. The patient who died was a charwoman employed in a hotel at which one of the visitors from Paris had been staying. Two other members of the hotel staff were infected. During the last twenty years there have been only 340 admissions for small-pox, with 54 deaths; 23 of the deaths occurred in one year, 1922.

Research and Pathological Work.

We gave an account (Journal, May 14th, 1927, p. 882) of the Board's southern group laboratory on the occasion of its opening by the Minister of Health. This laboratory is intended for research work into the primary causes of the diseases from which the inmates of the Board's institutions are suffering. All the institutions send to this laboratory their material for special investigations, and certain of them use it for routine work also. The number of bottles of diphtheria antitoxin supplied from the Board's antitoxin establishment during 1926 was 75,127, each bottle containing 4,000 units. The demand for serum culture tubes and throat swabs has largely exceeded that of any previous year.

An interesting account is given of an investigation carried out at Leavesden Mental Hospital to elucidate the origin of an outbreak of typhoid fever which occurred last summer, with 24 cases and 6 deaths. It was arranged to examine the urine and faeces of every inmate and, as far as possible, every member of the staff, so as to identify any carriers. The 2,051 inmates were duly examined, and 10 new carriers, all males, were found, and the existence of one old carrier was confirmed. No carriers were found outside the wards in which typhoid fever had occurred, and in one of the wards affected no carrier could be found even on repeated examination. No female carriers were found at all, even in wards in which typhoid cases had occurred. Members of the staff to the number of 464 were examined—12 refusing—and no carrier was found among them.

The conclusion drawn by Dr. J. E. McCartney and Dr. W. C. Harvey from an examination of 234 diphtheria carriers is that the cause of the carrier state is a pathological process in the upper respiratory tract preventing the normal elimination of the bacilli during convalescence. The organism does not appear to be existing on living tissue, but on products of inflammatory reaction, and thus leads an extra-corporeal existence. The removal of the pathological condition when found will result in cure. Pure throat carriers are promptly treated by tonsillectomy.

Many contributions by officers of the Board appear in this section of the report. Dr. W. Gunn reviews the present position of scarlet fever from the serological and clinical standpoints. Dr. Alexander Joe gives a short survey of diphtheria prevention work in Edinburgh, where he formerly worked, and Dr. W. Kelleher of similar work on the training ship *Exmouth*, where the Board trains boys for sea service. Dr. H. Carter writes on the prophylactic value of alkaline therapy in scarlatinal nephritis. Dr. J. V. Armstrong describes the use of the carbon arc in infectious fever practice; his most definite conclusion, after the treatment of 10 cases of whooping-cough, 5 of measles, and 4 of other complaints, is that there were hardly any striking successes to record, and that where definite improvement occurred it was difficult to say how much was due

to careful nursing and feeding and how much to specific light therapy. There was improvement in the general condition, but no rapid disappearance of the special symptoms of the disease.

Mental Diseases and Abnormalities.

The Board has in its various hospitals and colonies provision for 10,000 mental cases. For a long time the only cases received were under the Lunacy Acts (chronic and harmless certified), but the number of these cases has declined in recent years; there has been an increase of cases certified under the Mental Deficiency Act, as well as of three groups of uncertified persons—namely, sane epileptics, feeble-minded persons according to the definitions of the Local Government Board, and aged poor who by reason of mental infirmity need institutional care. Some anxiety is expressed by the Board at the number of feeble-minded persons who, after committing offences against the law, are remitted to the care of the Board from the police courts. The reception of these persons tends to accentuate the difficulties of managing the various branches of a certifying institution.

Another special class of mentally abnormal persons with which the Board has been concerned in recent years is that of persons suffering from the after-effects of encephalitis lethargica. These cases cut across the scheme of classification which the Board has adopted in mental cases, for some of them are certified under the Lunacy Acts, some under the Mental Deficiency Act, and others are not certified at all. Whatever their mode of entry, the practical effect is the addition of a number of particularly troublesome and turbulent individuals for whom the available accommodation is not very suitable. An experimental scheme under which the Board provided 100 beds at one of its institutions for the treatment of children so afflicted is the subject of a report after a year's work. Out of 133 cases in residence during the year, 12 have been discharged as much improved, 6 others in such a condition that further treatment was considered unlikely to improve them, 4 as unsuitable, and 18 at the request of the parents, who desired to have their children home. It has been decided to continue the experiment for another year, and a stricter selection is to govern the admissions. Dr. G. A. Borthwick contributes a very long and interesting report detailing his observations on these children, but beyond showing what an overwhelming amount of clinical material they present, and what problems of classification they bring in their train, he does not attempt to draw any conclusions. Dr. T. H. Whittington, visiting oculist, states that the ocular signs commonly present at the onset and during the acute stage of the disease are comparatively rare during the post-encephalitic stage. What was most notable was the number of children with a tendency to divergence of the eyes.

There are detailed reports from each of the mental hospitals and a specially lengthy one from the Darenth training colony, where there is a population of between 600 and 700, many of whom are being trained industrially.

Other Medical Work of the Board.

The number of patients admitted to the Board's institutions for pulmonary tuberculosis during 1926 was 3,837. As the number of tuberculous sick is undoubtedly diminishing, and as there is not a corresponding diminution in the Board's figures, it is inferred that sufferers from this condition are resorting increasingly to hospital treatment, a circumstance particularly to be welcomed, as the segregation of advanced cases of lung disease cannot but help to reduce gross infection of other members of the family. Of the 1,008 patients discharged from two sanatoriums for adults during the year, 72 per cent. were classed as fit for full work or light work, and in 35 per cent. the disease was described as quiescent. Dr. Blyth-Brooke has investigated the after-history of many patients treated in a sanatorium, and suggests that in the prognosis, while temperature charts and records of any haemorrhage may be passed over quickly, pathological reports on the sputum should be carefully followed. His statistics show that diminution of the number of bacilli in the sputum during treatment is a favourable sign.

The expansion of St. Mary's Hospital, Carshalton, by 350 beds for the accommodation of children suffering from subacute rheumatism, the later stages of acute rheumatism, rheumatic chorea, and rheumatic carditis, was determined upon a year ago, but the work which has to be done before a report can usefully be made is still considerable. At the same hospital 315 non-tuberculous orthopaedic cases were completed last year.

Among reports by officers and consultants is one from Mr. Treacher Collins, stating that the establishment by the Board twenty-four years ago of a school at Swanley for the isolation of contagious eye disease has served to stamp out trachoma from the Poor Law schools of London. In 1911 the number of cases admitted from such schools was 103; last year there were only seven cases, five of which came from Poplar, where, in all probability, they had contracted the disease in connexion with the large outbreak of trachoma which occurred in the London County Council schools in that borough in 1925. The institutions of the Board received 3,928 sick children in 1926.

Other matters contained in the report include the inquiry into the conditions of the nursing service which has been proceeding under a committee of the Board. The Board complains of sweeping and general statements which have been made in support of the excellent movement for the provision of hostels for women. It has been said that hundreds of women tramp the streets of London nightly looking for shelter, a thing which, if true, would imply neglect of duty by the authorities. But in fact, during the last five years, a census of homeless women—taken usually during a night in February—has shown an average of only 27 and a maximum of 42 on the streets; while the number of vacant beds in common lodging houses on those nights was from 300 to 500. Any destitute person could, by applying at the Board's night office, have been provided with a bed, either through the voluntary agencies or, as a last resort, in the casual ward.

New Zealand.

[FROM OUR CORRESPONDENT.]

RESEARCH WORK.

FOLLOWING upon the epidemic of poliomyelitis in 1925, the New Zealand Branch of the British Medical Association induced the Government to undertake a research into the causes and prevention of this disease, the work being undertaken in the Otago Medical School. There have been delays in obtaining supplies of monkeys for experimentation, and difficulties of technique, but the research so far has served to confirm the conclusions of other observers; no definite result can be claimed as an addition to our knowledge of the disease. Another inquiry is being made at Dunedin into the nature of rheumatoid arthritis and allied rheumatic conditions. Laborious complement fixation tests as elaborated by certain investigators in America have been made in Dunedin, with the result that the claims of these workers in regard to the diagnosis and treatment of rheumatoid arthritis by serological methods have been sustained. In cancer research information is at present being obtained from the hospitals throughout the country and the results collated as a preliminary to further investigation. Tuberculosis in school children has been investigated by making tests of children in schools in town and country. Positive reactors are again examined radiologically and by tuberculosis specialists, and such children are sent to sanatoriums or followed up in their homes, advice being given to their parents.

GOITRE REMEDIES.

Regulations issued by the Health Department, which come into force immediately, require that every bottle of goitre remedy shall bear a description of its active ingredients, and also a prominent warning that the remedy should not be taken save under the advice of a medical man. Since the public has learned of iodine treatment there is reason to believe that an increase has occurred in the number of cases of exophthalmic goitre, and these regulations are the outcome. The public has failed to

appreciate that, while a small amount of iodine is necessary for the proper functioning of the thyroid gland, large amounts cannot be taken without serious risk. The view of the Health Department is that iodized salt can safely be used for household purposes, and its use is authorized in breadmaking. The proportion of potassium iodide in this salt is 1 in 250,000. The primary purpose of this iodized salt is to prevent goitre from developing, though cases have occurred where goitre has lessened in size or even disappeared through its use. Seeing that regulations may be used to restrict the ill effects of proprietary and patent goitre cures, it would appear possible that more restrictions can be placed upon the indiscriminate sale of quack remedies in the interest of public health.

Cost of Hospitals.

Hospital accommodation provided in New Zealand is, according to a statement made by the Director-General of Health, five beds per 1,000 of population, whereas the United Kingdom provides one bed per 1,000. Expenditure in New Zealand on hospitals is a serious drain on the finances of the country and is increasing; 73 per cent. of the Revenue of all the hospital boards is derived from public funds, levies on local authorities, and subsidies contributed by the Government. The cost of hospital treatment averaged 15s. 3d. a head daily. The capitation charge averages 9s. a day, but of this only 3s. 6d. is collected. The contributions from public funds, levies, and subsidies has risen from £443,000 in 1914-15 to £1,238,000 for 1925-26, and the expenditure per head of population from 7s. 9d. to 20s. 5d. During this period of ten years no fewer than forty new hospitals have been opened, in addition to extensions of existing institutions. Mr. Love, director of charities in Victoria, a recent visitor to New Zealand, stated that the New Zealand system of hospital finance does not provide a sufficient check upon extravagance, and leads to waste and inefficiency.

India.

Leprosy in India.

INDIA is one of the countries most favourably placed for the development of anti-leprosy work. Recently the Mission to Lepers has formulated a practical scheme for coping with the leper problem, and the British Empire Leprosy Relief Association has been actively engaged in stimulating interest in leprosy; as the result of an appeal of the Viceroy £150,000 has been subscribed for leprosy work. An additional research worker has been appointed at Calcutta, and it is hoped that within a short period well trained men of the assistant surgeon grade will be placed in all districts of Assam, Bengal, and the Central Provinces. One or two first-class practitioners are being allocated for leprosy work, and out-patient dispensaries are being started in all big cities. By linking this scheme with leprosy hospitals in the provinces when they are established a complete anti-leprosy service for the whole of India would be brought into being. As a preliminary to the organization of such a service a survey of the present institutions is the first essential, and this has been ably supplied by Dr. R. G. Cochrane, medical adviser to the Mission to Lepers, in a pamphlet of twenty-two pages, entitled *Leprosy in India: a Survey*,[1] which Sir Leonard Rogers, in a prefatory note, states should prove invaluable to the authorities of that country. The survey is the result of a visit to India in 1924 of a deputation sent by the Mission to Lepers. Dr. Cochrane accompanied this deputation, and a reference to its general report appeared in our issue of November 6th, 1926 (p. 845). The census of 1921 estimates the total number of lepers in India at 120,000; the returns, however, are known to be very unreliable, in many cases being sent in by ignorant villagers, and the author considers that if the census figures were multiplied by eight or ten a better realization of the true number of lepers would be obtained. The pamphlet deals with each province separately, stating the number of lepers and their distribution in the area, the facilities for leprosy work, the clinics and other centres for educating medical men in the work, the hospitals, homes, and other institutions for the treatment of lepers, and their accommodation and organization; an excellent map, giving some of the above details at a glance, is appended. During the last decade much more precise practical knowledge of the stages of the disease has been attained. Three practically important types of case are now recognized: early cases, later infective cases, and chronic, uninfective crippled nerve cases. Formerly there was no effective treatment for any stage, but it is now known that most of the first class lose all signs of the disease under treatment, and are thus prevented from going on to the infective stage; reduction of the prevalence of leprosy depends on the possibility of bringing these cases under treatment. For the later infective cases isolation is the essential measure. The crippled nerve patients could be sent to their homes without danger and with much saving of expense; this has been done in South Africa, but in India the patients are apt to be turned adrift by their relatives, and look to the various missions and Government asylums for relief, which, however, does nothing in this case to reduce the incidence of leprosy.

[1] *Leprosy in India: a Survey.* By Robert G. Cochrane, M.B., Ch.B., M.R.C.P.Lond., D.T.M. and H. London: World Dominion Press. 1927. (5 × 9¾, pp. 22; 1 map. 2s.)

Ambulance and Hygiene Training.

The annual general meeting of the St. John Ambulance Association and the Indian Red Cross Society was held on June 24th, with the Viceroy in the chair. The annual report of the St. John Ambulance Association stated that 1,130 courses of instruction had been held at 316 stations, and that there had been an increase of about 42 per cent. in the number of persons trained in first aid, as compared with 1925; gratifying progress had been made also in extending knowledge of home nursing, hygiene, and sanitation. Ambulance training was now being recognized more widely as a valuable part of education; in twelve provinces it had been introduced into the curriculum of the police force, and the Railway Board was considering a proposal to adopt it for its men. All-India ambulance competitions were becoming widely popular. The report of the Indian Red Cross Society contained a reference to the new scheme for supervising soldiers invalided out of the Indian Army. The society appealed for an increase in membership; it was mentioned that in 1926 it had only five thousand members, as compared with two and a half million in Japan. Provincial branches were invited to establish travelling dispensaries for service in rural areas. A striking illustration was given of the valuable work rendered to pilgrims by the opening of a fully equipped hospital at Hardwar. This institution, with its forty beds, received a large number of patients; in it numerous operations were performed, and stretcher-bearers were provided for emergencies.

The Parasitology of Plague.

The account given by Dr. L. Fabian Hirst in the *Ceylon Journal of Science* of the result of his researches in the City Microbiological Laboratory, Colombo, from 1912 to the present day has been reprinted in a volume.[1] Part I, with an introduction, deals with the transmission of plague by the blood-sucking ectoparasites of rats and the bionomics and biting powers of rat fleas, their identification and distribution; Part II, with the flea species factor and other considerations governing the spread of plague, regional studies in the parasitology of this disease, and the relation of parasitology to plague prevention. At the time when Glen Liston and the British Indian Plague Commission (1905-12) established the rat flea theory of transmission on a firm basis, many striking anomalies in the spread of plague in India, including the causes of the comparative

[1] *Researches on the Parasitology of Plague.* By L. Fabian Hirst, M.D.Lond. Colombo Municipality Department of Health. Colombo and London: The Times of Ceylon Co., Ltd. 1927. (Cr. 4to, pp. 155-455; illustrated.)

freedom of large areas, remained unexplained. Whether all species of fleas readily biting rats were equally efficient as vectors of plague between rat and rat was unknown, and little attention had been paid to the relative responsibility of the various species of rat fleas for the spread of epizootic as opposed to epidemic plague. To the elucidation of such problems Hirst has devoted himself, and his general conclusions may be quoted:

"The spread of bubonic plague among rats throughout the world primarily depends on the [*Xenopsylla*] *cheopis* population of the invaded region. This population is a function of both the *cheopis* flea index, *i.e.*, the average number of *cheopis* per rat, and the rat population, commonly gauged by rats trapped per 100 traps set.

"The magnitude of the *cheopis* index depends primarily upon the effect of climate on *cheopis* reproduction, and secondarily, upon the nature and contents of the premises in which the *cheopis* is reproduced. The rat population depends primarily upon the available food supply."

The constant relation between *cheopis* distribution, plague prevalence among rats and human beings, and the distribution of imported grain is emphasized, and the practical issues involved by full recognition of these discoveries become obvious. The study of the history of the spread of plague in Colombo associated with the history of a particular flea is as interesting reading as the history of the migrations of a human race.

Public Health in Agra and Oudh.

In the United Provinces of Agra and Oudh there was during 1925 a satisfactory decline in all diseases and causes of death except small-pox and injuries. Lieut.-Colonel C. L. Dunn, I.M.S., director of public health in the United Provinces, states in his annual report that no regular small-pox hospitals exist, patients being treated in temporary buildings or general hospitals for infectious cases. It has often been very difficult to isolate these patients satisfactorily, owing to the lack of compulsory measures, and much still remains to be done as regards vaccination. He comments also on the difficulty of obtaining from the district authorities notifications of primary outbreaks of cholera without considerable delay; in some cases the epidemic had actually subsided before information was received of its having begun. The Indian Research Fund Association during the year made a financial grant towards cholera research. Antimalarial activities were intensified in various places, particularly in the Sarda Canal area, where a complete system of drainage has been constructed despite considerable difficulty; the results of quinine prophylaxis were particularly good. Plague outbreaks continued to be mild on the whole, though the south-eastern and some western districts experienced severe epidemics. Prophylactic inoculation was usually welcomed by the inhabitants, and no difficulty was experienced in securing the evacuation of infected villages. The plague staff consisted of four special health officers and forty-two travelling dispensaries. Active research was carried on into the transmission of this disease by the two chief varieties of fleas encountered. It is suggested that the present mildness of epidemics may be an indication of a decline of plague in severe epidemic form. The thirty-six public health travelling dispensaries which are engaged in general medical work are becoming increasingly popular, and proved most valuable in the control of epidemics of various kinds; during the year under review over 240,000 patients were treated by them, and more than 4,000 operations were performed. For special emergencies twelve additional travelling dispensaries were temporarily mobilized and treated some 12,000 patients. Education in the prevention of disease continued energetically, and was a useful feature of the work of these dispensaries. A hygiene publicity bureau was established in the province and extensive educational tours were made, forty magic lantern sets being used. In response to the growing public demand for more facilities of this kind additional lanterns and more booklets and posters are to be provided. Grants in aid were received from the Government, various district and municipal authorities, and the Indian Red Cross Society.

England and Wales.

Some Problems of Mental Hospital Administration.

Increase in the number of patients admitted during 1926 to the Stafford Mental Hospital has compelled attention to the growing difficulty of accommodation. It has been found necessary to devote the twenty beds in the isolation hospital to convalescent male patients, but it is obvious that should an epidemic occur the necessary evacuation of this building would cause very severe congestion in the main wards. An annexe containing ten beds for tuberculous male patients is nearing completion, but additional accommodation for uncomplicated mental cases will be required at an early date. Dr. B. H. Shaw, medical superintendent of the hospital, in his annual report for the year ending March 31st, 1927, suggests that relief of overcrowding can be effected only by making use of the vacant accommodation in Poor Law institutions for the reception of certain cases, and by special provision for idiots, imbeciles, and other patients with definite mental deficiency becoming manifest at an early age and requiring institutional treatment. He considers that to associate together the imbecile type and persons suffering from simple mental breakdown is most undesirable. Among other objections to the treatment of cases of early mental disorders in general hospitals Dr. Shaw includes the fact that these institutions are usually situated in industrial centres, where there is little possibility of securing the quiet outdoor environment and special amenities necessary for the successful treatment of mental breakdown. Moreover, the training of general hospital nurses does not assist them in dealing with early mental cases, since the rigid discipline necessary in dealing with physical illness is out of place in the treatment of the extreme temperamental sensitiveness associated with mental disorder. Dr. Shaw considers that the establishment of clinics for early cases is unlikely to have very much effect unless arrangements are made to remove the patients from their home surroundings. He is driven to the conclusion that any measures to relieve the existing congestion, other than the erection of additional buildings, can only be considered palliative; he mentions that the erection of a separate building for acute and newly admitted cases has been prevented hitherto by financial considerations. The question of "boarding out" patients has been considered, and this policy may have to be adopted, though, in Dr. Shaw's opinion, it has little to commend it except expediency.

The Royal Victoria Infirmary, Newcastle-upon-Tyne.

During 1926 the number of in-patients admitted to the Royal Victoria Infirmary, Newcastle-upon-Tyne (13,942), established a record for this institution, additions being made to the beds in the Infirmary and thirty beds being provided in the Innes Hopkins Home at Ryton, which was taken over as an auxiliary hospital. On many occasions extra beds had to be placed in the wards. In the annual report of this institution for 1926 it is stated that much of this expansion was rendered necessary by motor accidents, which reached the figure of 986; 432 persons had to be admitted as in-patients. These figures are double those of the previous year; 54 patients died, equivalent to a mortality due to motor accidents of over one a week. Since many of these patients were in a very grave condition on admission preference had to be given them over those on the waiting list, the number upon which at the end of the year was 2,100. During 1926 accidents of all kinds were responsible for the admission of 2,119 patients, as compared with 2,096 in the previous year, and this in spite of the closure of many collieries and much diminished employment in various other industries. The Infirmary committee is therefore compelled to give serious consideration to the problems created by these conditions. Moreover, in the out-patient departments there was an increase of 8,000 new cases, and the number of operations rose from 13,225 in 1925 to 14,409 in 1926. The general expenditure of the Infirmary exceeded the income by nearly £10,000. The fact that voluntary subscriptions declined by

only £11,703 is considered to be a matter for congratulation in view of the widespread distress consequent on the industrial situation. There was also a reduction in the contributions by patients, but it is believed that when employment becomes better a great increase in the donations may be expected. Promises have already been received to the effect that an attempt will be made during the current year to compensate in some measure for the deficiency of 1926.

ST. BARTHOLOMEW'S HOSPITAL.

St. Bartholomew's Hospital is in the happy and unusual position of having an income in excess of its expenditure. The explanation is that it receives over £120,000 from invested property. It has in hand a scheme for erecting an operation theatre block, a new surgical ward block, and recreation rooms for nurses at a cost of about £200,000. It now has 688 beds, and 666 were in constant use during the past year, when £18,000 was spent on renewals and repairs; it paid £4,800 in rates and taxes. It received 2,972 persons suffering from street accidents or illness brought to it by motor ambulances belonging to the Corporation of the City of London or the London County Council.

Ireland.

PROMOTION OF MEDICAL OFFICERS.

ARISING out of representations made on behalf of the profession to the Minister for Local Government and Public Health (Free State) with regard to Section 5 of the Local Authorities (Officers and Employees) Act, 1926, in connexion with the promotion of medical officers by boards of health the Minister has addressed an important circular letter to each local authority. The Minister's approval for the transfer or promotion of an existing medical officer is necessary under Section 5 of the Act, and he clearly defines the conditions to be fulfilled by the local authorities in order to get his approval of appointments made by them by way of promotion.

The Departmental Secretary states that he is directed by the Minister for Local Government and Public Health to refer to Section 5 of the Local Authorities (Officers and Employees) Act, 1926, under which, subject to the sanction of the Minister, local authorities are empowered to make appointments to offices to which the Act applies (as defined in Section 2 thereof) from amongst persons holding pensionable offices under local authorities or in receipt of superannuation allowances from local authorities and who are performing or had performed duties the same as or similar to those of the office to which it may be proposed to make an appointment. I am to state that the Minister has had under consideration the procedure which should be followed by him in giving or withholding his sanction to a local authority proceeding to make an appointment under the section, and has decided that in future he will not give his sanction to the making of an appointment thereunder unless he is satisfied that a suitable and properly qualified person is available for appointment. In giving or withholding his sanction to the making of an appointment under the section, the Minister will be influenced solely by the merits of the case. Accordingly a local authority should in the interests of efficient local administration carefully consider the qualifications, training, experience, age, character, and length of service of the persons available for appointment. Due weight should be given, other things being equal, to seniority, since one of the objects of the section is to facilitate the promotion of existing officers of local authorities on grounds of ability and length of service. In future, therefore, an application for the Minister's sanction should be accompanied by a clear statement of the grounds on which the application is made.

TUBERCULOSIS IN BELFAST.

In his annual report for the year ending December 31st, 1926, Dr. Andrew Trimble, chief tuberculosis officer for the county borough of Belfast, states that the attendance at the tuberculosis institutes for examination and treatment numbered 34,040. Of these, 1,904 were new patients, among whom 1,054 were diagnosed as tuberculous, 115 as "suspect," and 856 definitely non-tuberculous, 121 having been transferred from the "suspect" list of 1925. The report showed that 64 fewer patients were found to be suffering from or suspected of tuberculosis than during the previous year; this decrease, though small, is gratifying, in view of the prevailing industrial distress and housing shortage. In addition to the above, 220 old patients, unable to travel, were re-examined in their houses, and 44 at the Belfast Infirmary; 822 patients on domiciliary treatment were also examined, of whom 254 were apparently cured, no signs of active disease being found. If this result can be attained under domiciliary treatment, with its attendant disadvantages of overcrowding and bad hygienic arrangements, how much more, it is asked, could be accomplished if housing and social conditions were bettered, and patients could and would carry out their instructions to greater advantage? The ratio of pulmonary tuberculosis to other forms of the disease varies only slightly from year to year, about 71 per cent. of cases being pulmonary; the incidence among males and females, calculated on the ratio of their respective numbers in the population, was almost equal; in former years females were the greater sufferers. Dr. Trimble draws attention to the social conditions favouring infection by contact, and notes that, after making every allowance for inadequate housing, unemployment, and distress, many patients still have to share bedrooms and beds with other members of their families; only 14.5 per cent. of patients occupy single beds. The number of *x*-ray films exposed during the year was 225, and valuable work has been done in the dental department. The sputum was examined in 902 instances, and 938 other bacteriological examinations were made. Dr. Trimble states that from an investigation of 1,691 cases of non-pulmonary tuberculosis it was found that 43 per cent. had been in association with pulmonary forms; he therefore considers it fair to assume that the 57 per cent. who had no such association were infected through milk. He draws attention to the unsatisfactory state of the local milk supply and notes that, of 17 samples found to contain tubercle bacilli, 15 were from milk produced outside the city boundary, and therefore outside the jurisdiction of the local authority; he advocates one governmental central authority for milk inspection and also an extension of the regulation (in force in Great Britain, but not yet applicable to Northern Ireland) which prohibits persons suffering from pulmonary tuberculosis from handling milk for sale. In addition to the ordinary methods of diagnosis and treatment by hygienic measures and medicines, the Belfast Insurance Committee gave a sum of £80 for the purchase of an interferometer, to investigate the possibility of earlier diagnosis. The use of sanocrysin has been continued; Dr. Trimble is of the opinion that this drug marks a distinct therapeutic advance in certain types of cases. Towards the end of the year a trial of Ruppel's serum was begun, but no opinion on its efficacy can yet be expressed. Lectures given during the year obtained wide circulation in the press. As to the value of the tuberculosis scheme in Belfast, Dr. Trimble says that the death rate from all forms of the disease, as compared with 1914, has fallen by 38.5 per cent., and that of the pulmonary forms by 34 per cent. In the five years 1914-18 the number of children under 10 years dying from tuberculosis was 298, while in the five years 1922-26 the number was 109, a reduction of 63.5 per cent. Lest it should be thought that this result is due to a general improvement in the health of the people, he states that, whereas the general death rate, exclusive of tuberculosis, has fallen 20 per cent. between the five-year periods mentioned, the death rate from tuberculosis has fallen 39 per cent.—that is, almost twice as rapidly—and for these reasons Dr. Trimble feels justified in saying that the scheme has, up to the present, fulfilled its object.

VITAL STATISTICS FOR NORTHERN IRELAND.

During the quarter ending June 30th, 1927, 7,298 births were registered in the twenty-seven superintendent registrars' districts in Northern Ireland; this was equivalent to an annual birth rate of 23.3 per 1,000 of the estimated population, as compared with the corresponding figures of 17.6 for England and Wales, and 20.6 for Scotland. The deaths registered during the quarter numbered 4,979, representing an annual rate of 15.9 per 1,000, as compared with 11.0 for England and Wales, and 12.9 for Scotland. The birth rate was 0.4 below the rate for the corresponding quarter of 1926, and 1.2 below the average rate for the second quarters of the ten years 1917-26. The death rate was 0.7 below the rate for the corresponding quarter of 1926, and 1.3 below the average for the second quarter of the previous ten years. Of the 4,979 deaths registered,

914, or 18.4, occurred in public institutions, and 445, or 8.8 per cent., were uncertified, there having been neither a medical attendant during the last illness nor an inquest held by a coroner. The number of successful primary vaccinations registered in Northern Ireland in the quarter under review was 7,138. The birth rate for county boroughs and urban districts, which contain more than one-half of the total population of Northern Ireland, was 25.8 per 1,000 of the population; the birth rate for the remainder of Northern Ireland was 20.6 per 1,000. The mortality in the county boroughs and urban districts was 14.1 per 1,000 of the population, and the corresponding rate for the remainder of Northern Ireland was 17.7 per 1,000. The urban mortality from the principal epidemic diseases recorded during the quarter was equivalent to an annual rate of 0.8 per 1,000 of the population; the death rate from these diseases for the remainder of Northern Ireland being 0.4 per 1,000.

Scotland.

A TRIAL FOR MURDER IN 1728.

AT the annual meeting of the Forfarshire Medical Association the presidential address was delivered by Dr. R. C. Buist of Dundee, who took for his subject "A trial for murder in Forfarshire nearly two hundred years ago." In 1728, Dr. Buist said, the provost of Forfar was, like Provost Lowson of to-day, a doctor. He was the first medical witness in a trial for murder which must have attracted a great deal of attention, for the dead man was Lord Strathmore, and the persons concerned in the brawl which led to his death were all local notabilities. On May 9th a daughter of Carnegie of Lour had been buried, and after the funeral the gentlemen, having dined and drunk a good deal of wine, adjourned to an inn in Forfar, where they drank more wine. Lord Strathmore then went to call on Lady Auchterhouse, widow of a relative, and sister of Carnegie of Finhaven, who followed him to her house, accompanied by Lyon of Bridgeton. An altercation took place about a proposed matrimonial alliance; Lyon became violent and hammered Carnegie's hand on the table. The dispute was continued in the street and Lyon upset Carnegie into the gutter, which was a very muddy gutter, and filled his top boots. Carnegie was helped out, and saying that this was unbearable, drew his sword and made after Lyon. The Earl of Strathmore interposed as Carnegie lunged forward, was impaled on the sword, and died in two days. Three months later Carnegie was tried for murder. A Dr. John Kinloch of Dundee, who had graduated M.D. at Rheims in 1712 and had studied at Leyden, testified that at the funeral the two contestants had been quite courteous to each other, supporting the plea of the defence that the tragedy was not purposive and that there was no element of malice in it. William Douglas, late provost and a chirurgeon-apothecary in Forfar, gave evidence that he had "pansed" the earl, and had advised that physicians should be summoned from Dundee. He noticed that the omentum had been pulled through the wound, and deduced therefrom a nick in the sword; such a nick was found in Carnegie's weapon. Thomas Crichton, a surgeon-apothecary in Dundee, said that the sword had entered the front of the abdomen and passed through the back; the earl had expressed the opinion that the thrust was not intended for him. It may be noted in passing that in the rising of 1745 Crichton was surgeon to the second battalion of Lord Ogilvie's regiment, and passed the rest of his life on his brother's estate at Ruthven. A Dr. John Wedderburn of Dundee, who had studied at Leyden in 1700 and graduated M.D. of Utrecht in 1703, testified that he had been present at the necropsy on the earl and that the sword had passed through the caul, the gut-colon, and the plexus mesentericus. A Dr. Charles Fotheringham of Dundee, who also had studied at Leyden in 1722 and graduated M.D. at St. Andrews three years later, agreed with the evidence of Thomas Crichton. Dr. Buist stated that the jury, by a plurality of votes, brought in a verdict of "not guilty." At the dinner after the meeting the president was supported by the Earl of Strathmore and Dr. J. Lowson, provost of Forfar. The president proposed the toast of "The County of Forfar," and Lord Strathmore responded. The toast of "The Guests" was proposed by Dr. T. F. Dewar, who had been elected to succeed Dr. Buist as president for 1927-28, and acknowledged by Provost Lowson. The toast of "The Forfarshire Medical Association" was proposed by the Rev. W. G. Donaldson, parish minister of Forfar, and Dr. J. Cable replied.

Correspondence.

AN OPERATING THEATRE OUTFIT.

SIR,—Opinions seem divergent as to how the ideal operating room should be constituted.[1] Some proclaim the advantage derivable from artificial ventilation and calefaction, while others, including myself, prefer a theatre which receives a share of any sun that's going, as they consider any room uninhabitable—a tubercle haunt—if its atmosphere is denied disinfection by sun rays, and reject artificial ventilation in favour of ordinary fresh air through open window, with some windows at the level of ceiling to eliminate vitiated air.

I am in complete accord with Mr. Rowlands and Mr. Hamilton Whiteford as to the irrational practice of working in a stifling atmosphere, detrimental alike to patient and operator. Experience derived from the great war accentuates the necessity to adopt measures to keep the patient warm during operation—this cannot be effected by a superheated atmosphere and a cold slab, but by some special heating of the operating table, for which fixation of an electric[2] resistance in the latter has been found extremely convenient and efficacious, in combination with an insulating mattress (covered by rubber) to prevent burn; the body of the patient above and below the operating field should be kept warm by wrapping in wool with mackintosh superimposed—all fixed in position by strong safety-pins.

Keeping a patient warm during operation is analogous to keeping warm in bed during winter—namely, plenty of covering, with an open window to provide the fit and fresh feeling in the morning. Possibly this may be a personal idiosyncrasy, and open to correction by those who not only sleep with window shut, but cover mouth, nose, and the rest beneath the same sheets. This is especially apropos to the context, as it simulates the condition of the patient under anaesthesia in a close room, asphyxiated in exhalation and gas.

In my theatre a free supply of fresh air is provided during hot weather by four large lateral windows, which are kept wide open, and two long narrow windows level with the ceiling, which are open in all seasons. Currents of air which might affect exposed viscera are avoided by closing the corresponding lateral windows.

From the beginning (1894) it has been my custom to wear clothing which will afford the light and airy feeling during operation so desirable; short hair and nails and healthy, clean teeth help to obviate the necessity for a headgear rivalling the immaculate combination of a Turkish madonna and a French chef, not to add "plus fours"; a light sterilized gown over a light mackintosh apron comprise the outfit.

While a believer in the employment of sterilized rubber gloves by assistants and dressers—and personally in septic cases—I should as soon think, before entering the drawing-room after a post-prandial wash of hands, of confiding the adjustment of buttons to gloved fingers, as to trust the latter to separate adhesions—out of sight—in an abdomen, or palpating for a foreign body or tumour in the brain. Physiologists who have made various studies of organic tactile sense declare that even with the interposition of the most delicate foreign membrane between living parts acuity of perception becomes diminished, and stimulation to cellular response appreciably lessened.

Sand-bags and sand-pillows are employed to secure the patient's position, except for the Trendelenburg, which is effected by means of a Doyen table, with similar electric heating in its central compartment.

[1] *Annals of Surgery*, January, 1923, author.
[2] BRITISH MEDICAL JOURNAL, February 4th, 1922, author.

For use on dull days and at night two 1,000-candle-power electric lamps—one over each table—are suspended from the ceiling. During winter or other cold period three calefactors standing out from the wall heat the interior. The walls of the theatre are lined with stucco, and are rounded off at the level of floor and ceiling. They are painted annually—the lower half reseda green and the upper section, and ceiling, white.—I am, etc.,

Buenos Aires, May 31st. JOHN O'CONOR, K.B.E., M.D.

"PEINE FORTE ET DURE."

SIR,—The very fascinating article by Mr. R. R. James in your issue of August 6th (p. 230), entitled "Hanged, Drawn, and Quartered," raises many points of considerable interest. Torture has not been recognized by the common law of England, though it was carried out frequently in the Middle Ages. But there was one form which could be ordered by a judge, not to obtain evidence, but to compel a prisoner who "stood mute" to plead, or to punish him if he did not do so. Before the infliction of this form, the *peine forte et dure*, the prisoner was warned three times, and the dreadful penalty explained to him; he was then given a few hours to think the matter over. If the accused were still obdurate, the judgement of penance was pronounced and carried out. The sentence was not left to the discretion of the judge, for he was, by law, compelled to pass it in cases where an accused person refused to plead. The wording of the terrible judgement was as follows:

> "That you be taken back to the prison whence you came, to a low dungeon into which no light can enter: that you be laid on your back on the bare floor, with a cloth round your loins, but elsewhere naked: that there be set upon your body a weight of iron as great as you can bear and greater: that you have no sustenance save on the first day three morsels of the coarsest bread, on the second day three draughts of stagnant water from the pool nearest to the prison door, on the third day again three morsels of bread as before and such water alternately from day to day till you die."

There are many recorded instances in which this was carried out. One of the most remarkable is that of Major Strangeways. In 1685 he was accused of the murder of his brother-in-law. He refused to plead, and this meant he could not be tried, and therefore his lands would be preserved for his heirs. He was sent to endure the *peine forte et dure*. Major Strangeways was pressed to death, the executioners mercifully hastening the carrying out of the sentence by adding the weight of their own bodies to the mass of iron, and thus saving the prisoner the rest of the torture.

The barbarous law was repealed in the reign of George III. Before that reign many offences were punishable by hanging—for instance, arson, rape, forgery, house-breaking, and horse-stealing. Juries, moved by feelings of pity, over and over again refused to convict even in the most obvious cases, for they considered the punishment too terrible for the offence committed. In 1808 the law was so altered that murder and treason were practically the only offences for which the death penalty remained.

Previous to the passing of the Acts in the reign of George III public opinion allowed even young children to be executed. In 1791 a boy of 8 who had set fire to a barn was hanged. It was only in 1908, when the Children Act became law, that the death penalty was abolished for young people under 16.

Mr. James refers to death by boiling. At one time this was the punishment for poisoning, and was in a few instances actually carried out, but the law was repealed in the reign of Edward VI. There are a very great number of points in connexion with this question of brutal punishment to which I should like to refer, but I am afraid I have already occupied too much space.—I am, etc.,

Hove, Aug. 8th. L. A. PARRY.

ORTHOPAEDIC TREATMENT.

SIR,—In view of the somewhat pessimistic tone of the discussion on orthopaedic treatment at the last Representative Meeting (reported in your SUPPLEMENT of July 23rd, 1927, p. 43) it may interest your readers to hear of the lines on which the Bath, Somerset, and Wilts orthopaedic scheme is organized, as the conditions appear to meet admirably the recommendations of the British Medical Association Council.

In the area there are, in addition to the Bath City Clinic, ten major (surgeon's) county clinics, as well as various minor ones (attended by orthopaedic sister only). At these clinics no case is seen except on the recommendation of either the family doctor or the school doctor; in the latter case the family doctor's permission is first obtained, and he is invited to attend the clinic. A number of local practitioners avail themselves of this invitation and always receive a warm welcome. Some are regular attendants and even kindly transport cases to the clinics, where they often stay to watch the routine working, as well as to see the treatment of their own cases. Unfortunately the demands on the busy practitioner's time do not allow him to stay sufficiently long to gain a thorough knowledge of the working of a clinic, nor do as many practitioners make the effort to attend as the clinic authorities would wish.

In this area a great deal of work in the clinics is done by detachments of V.A.D. nurses, and among such voluntary workers the wives of local practitioners play a conspicuous part, which provides another link between the doctors and the clinics.

Narrowness of outlook ought not to be a danger in this area, as the surgeon in charge of the clinics, though now restricting practice to orthopaedic consulting work, had previously many years' training in general surgery and at one time had a large general practice.

Patients found to require dental, ophthalmic, or throat treatment are referred to local special clinics, provided that the parent declines to consult the family doctor. Other non-orthopaedic conditions are referred to general practitioners. It would be anything but kindness to force upon the family doctor the unremunerative type of case which forms the majority at the rural clinics—for example, the numerous progeny of an ill-paid farm labourer. As many neurological cases reach the clinics, an invitation is given from time to time to the neurologist attached to the central hospital to see groups of these at the various clinics.

As regards the staffing of the central hospital the beds are shared equally by two general surgeons and the orthopaedic surgeon, who runs the clinics; while the neurological physician, above referred to, is also attached to it.

Finally, as to general principles, the orthopaedic cases which represent the greatest cost in time and money are the very ones that general practitioners and even the local surgeons have been coping with for years, the initial lack of success being largely due to administrative and financial difficulties, which would never have been overcome but for the co-operation of the public health authorities.

As long as the conditions of general practice remain what they have been in the past the probability is remote that the general practitioner would have more success with these cases in the future than he has had hitherto. What these obstacles are has been pointed out in many recent speeches and articles.—I am, etc.,

M. FORRESTER-BROWN, M.S., M.D.Lond.,
Surgeon, Bath, Somerset, and Wilts Central Children's Orthopaedic Hospital.

August 15th.

TONSILS AND RHEUMATISM.

SIR,—With regard to Sir George Newman's recent dictum that enlarged or inflamed tonsils are a cause (or the cause?) of rheumatism in children, may I, in all diffidence but with a past of thirty years' constant experience of clinical work, make a conflicting suggestion?

Is it not a fact that the enlarged tonsils may be, not a cause, but in many cases a result of rheumatism? I think it is now fairly well established that many, if not most, cases of follicular tonsillitis are rheumatic in origin. That, I take it, means that the rheumatism was the cause of the tonsillitis, not vice versa.

I have had the chance of observing a number of cases in which, after the tonsils had been removed, the rheumatism has persisted. Many other cases of rheumatism in children I have observed where there never were any signs or symptoms of tonsillitis, at any time.

The tonsils, surely, are only aggregated masses of adenoid

tissue, and only become permanent foci of infection when materially obstructive to the pharynx, and when there is fibrous infiltration.

All the adenoid tissue in the nasopharynx is a possible cause of infection, even if we remove the tonsils; but does not all this tissue collect and kill many times more poisons (whether germs or otherwise) than it passes on?

The appendix is now having some justice done to it by pathologists. How many appendixes have been successfully and brilliantly removed (in a healthy condition) for a flapping, flatulent caecum? Endocrine glands are coming into their own, even the epiphysis and hypophysis cerebri.

When I was a house-surgeon we were taught to remove tuberculous cervical glands early. More recently, I believe, specially by the practice and teaching of the late Treves of Margate, it has been found that general constitutional treatment, without removal of glands (except when they suppurate), gives much better results.

I think it is a fact, well established by clinical observation, that enlarged tonsils, where there is a fairly good air-way, and not much, if any, permanent fibrous change, will often yield to general medical and hygienic treatment—especially, as regards drugs, to a mixture containing iodine. In my small experience I have used an alkaline potash solution containing tincture of iodine, which, I believe, has a local effect and, changing in the stomach to free iodine, iodide, and iodate, has a very important general effect.

What I wish to maintain is that (where there is a good air-way, or nose breathing can be maintained or developed) removal of a bit or two of adenoid tissue (the tonsils) which are surrounded by masses of adenoid tissue throughout the whole nasopharynx is, in many cases at least, not radical or curative. May I add what seems to me one of the most important single points in this subject—that is, that rheumatism in children so often takes at first, or for a long time, merely the form of "growing pains," which may very readily be overlooked?—I am, etc.,

Flackwell Heath, Bucks, Aug. 14th. G. D. PARKER.

LATE RESULTS OF TONSIL AND ADENOID OPERATIONS.

SIR,—A great deal is written on the technique of this operation, and figures are quoted—often running into thousands—of patients on whom it has been performed. It is always tacitly assumed that if the operation is satisfactorily performed (which goes without saying if the particular technique described is followed) the patient will be very much benefited; but in general practice, where we see our patients over a number of years, the result is not always so gratifying. It is one thing to be able to demonstrate the intact capsule of a tonsil which has been removed, but another thing to demonstrate patients before and after the operation. My own figures are too small to be worthy of quoting, but I have noticed the following end-results:

1. *Marked improvement* of general health and rapid growth following the operation.
2. *No particular effect.* This is sometimes very disappointing. For example, a boy, aged 5, was a mouth breather, rather deaf, stunted, thin, and had the adenoid fascies; the tonsils were constantly studded with white creamy exudate. After a course of gargles and throat painting, I enucleated the tonsils and removed the adenoids; he developed acute otitis media, for which I incised the drum. A year later the boy is still rather stunted, rather deaf, but a nose breather, and is still very thin.
3. *Child made very nervous.* I have known this happen twice. In one case a little girl, aged 5, frequently had white spots on her tonsils and a furred tongue, and was generally out of sorts. I enucleated the tonsils, after which she became very nervous, and for more than a year was subject to bad dreams and night terrors; after that I lost sight of her as the parents took her to another doctor.

Complications sometimes occur, of which, I suppose, otitis media is the chief. I have been fortunate in only meeting with it once in private, but in hospital it used to be fairly frequent.

I had one case of a child, aged 4, who had been operated on in London; she must, I think, have had acute tonsillitis at the time; she developed septicaemia. I saw her two months later, and she was in a pitiful condition of extreme marasmus and pains in all the joints, with slight pyrexia and pulse over 140; she had had various abscesses before I saw her, and was removed from hospital as the parents preferred her to die at home. She eventually recovered completely, except for the right hip-joint, which fifteen months later shows marked changes on *x*-ray examination, although it is quite painless and freely movable.

Another disappointment was in a boy, aged 17, who had two peritonsillar abscesses in four months. I prepared him with gargles and paints for a month and then removed the tonsils satisfactorily, as I thought. But a month later he developed another abscess, and the empty tonsillar fossa could be seen behind it. That was four years ago, and he has grown considerably and has not been troubled with his throat since.

A child, aged 6, had his tonsils and adenoids removed elsewhere, for frequent colds; there is not a scrap of tonsil to be seen, although he is a mouth breather. Since the operation he has had colds summer and winter alike, almost continuously; he is said to have thickening in one maxillary antrum.

Is it possible to know beforehand whether a child with enlarged tonsils will be benefited by operation, or whether it would be better simply to administer thyroid or some other remedy? I am convinced that the operation cannot be judged solely on the appearance of the tonsils after removal or of the throat from which they came.

I should like to see carefully compiled figures from a school medical officer, spread over a number of years, mentioning indications for tonsillectomy; whether there were general symptoms or whether the tonsils were removed simply on account of their bulk, weight curve before and after operation, opinion of the teachers and parents on the effect of the operation.

After confession of so many failures perhaps I may be excused for signing myself

August 8th. NEWERF.

ACUTE RHEUMATISM IN CHILDREN.

SIR,—Your interesting review of the report by the Ministry of Health on "Acute rheumatism in children: its relation to heart disease" in the JOURNAL of July 30th, (pp. 187-188) suggests one or two points perhaps worth more than a passing thought.

We read in the second paragraph: "The prevention of its (rheumatism's) disastrous cardiac sequelae is a question of ways and means; . . . the children must be received into suitable institutions. Poor homes, not the poorest," but of children attending "the public elementary schools" need reforming. Such reform "involves questions of general culture, education, the standard of living, and kindred subjects, and its consideration would afford useful employment for our politicians."

With regard to "suitable institutions" and all which that involves, is it by any means so unquestioned that the results of the national treatment of tuberculosis are commensurate with the expenditure, that we should be ready to launch out into similar institutional expenditure for another disease—a disease which, our present knowledge suggests, invades certain types of "homes" and avoids other types?

Who should carry out the investigation of the questions suggested, and others, in the homes of the school children? Possibly at once the thought comes that the medical inspector of school children (school doctor), with the school nurse and health visitor, are the very persons to do this work. Do their several occupations, their knowledge of these homes, and their breadth of outlook on social matters generally, make them most suited for such an investigation?

Who visits these homes so frequently, who knows so much about the standard of living, who would be so interested that the children of his patients should be sound and healthy as the general practitioner attending one or both parents, and probably the children also—as members of a juvenile club?

Government and public health medical officers, accustomed as they are to devising efficient schemes for any useful purpose, could surely present some plan to interest the general practitioner and to tap his knowledge and experience on this matter for the public good. It would need to be a plan which aroused his interest, did not involve much clerical work, and was recompensed by a suitable fee.

Further, the association of some general practitioners working under the National Health Insurance Acts with the official medical officers would result in a more useful scheme than if they were left out. In addition, it would be a practical example of the value of the private practitioner in matters of public health.—I am, etc.,

Tunbridge Wells, Aug. 13th. E. A. STARLING.

THE LUNACY LAW AND MENTAL DISORDERS COMMITTEE.

SIR,—In your leading article of August 6th (p. 221) you surmise that the non-acceptance of this committee's Memorandum by the recent Representative Meeting seems "to have been due in the main to a feeling that members had not had sufficient time" to consider the document. What motive determined the attitude of the silent members of the meeting no one, of course, can pretend to know, but those who criticized the Memorandum in speech produced reasons for their opposition other than the one which you present. That a Memorandum on so important a topic was submitted in so hurried a fashion might well excite comment; but the opposition also found place for serious criticism within the four corners of the document itself.—I am, etc.,

London, W.1, Aug. 20th. C. O. HAWTHORNE.

THERAPEUTIC ABORTION.

SIR,—In view of biochemical investigations and clinical observations published during recent years it is surprising to find that Dr. H. S. Davidson (as reported in the BRITISH MEDICAL JOURNAL of August 20th, p. 308) still advocates the practice of therapeutic abortion in certain cases of hyperemesis gravidarum.

Surely it has been conclusively demonstrated that the ill effects of pregnancy vomiting are essentially due to starvation (carbohydrate depletion) and, in the more severe degrees, to dehydration. These two factors adequately account not only for the usual ketosis and associated biochemical deviations from the normal, but also for the jaundice, oliguria, and albuminuria which may characterize cases that have been allowed to pass from bad to worse. Obviously we must further take into consideration the effects of physical strain and increased abdominal pressure; but it is entirely unnecessary to assume the influence of a mysterious "pregnancy toxin," and for that reason to destroy and remove the embryo.

The aims of treatment are perfectly definite, and merely involve the introduction of carbohydrates and fluids into the patient's system by one means or another. Admittedly this is not always easy, but in the vast majority of cases these objects are attainable by simple measures of suggestion and persuasion, and even artificial feeding is very rarely indicated.

To terminate the pregnancy represents a complete confession of failure.—I am, etc.,

London, W.1, Aug. 21st. FRANK COOK.

CLINICAL VARIATIONS IN DISEASE FROM THE HISTORICAL POINT OF VIEW.

SIR,—Sir Humphry Rolleston, in his magistral address on this subject, when discussing the question of encephalitis lethargica (BRITISH MEDICAL JOURNAL, August 6th, p. 208) mentions Tricot-Royer's interesting discovery of a contemporary poem relating an epidemic of hiccup in Flanders in 1413.

The importance of this lies in the fact that epidemiologists have always admitted the prevalence of "influenza" of the "knock-out" type in France and Italy in January and February, 1414. Those who see in epidemic hiccup a *forme fruste* of encephalitis lethargica must then at least agree that the geographical and temporal relation between epidemics of hiccup and of influenza recently noted did also obtain in 1414—five hundred years ago.

The point is further stressed when we realize that the epidemic of influenza mentioned by Hirsch as having occurred in 1411 was none other than the epidemic that did occur in 1414. As I have shown in *Influenza: Essays by Several Authors* (p. 71), Pasquier—the sole authority given by Hirsch for the 1411 affair—was evidently misled by the error of someone who transcribed part of the account given of the 1414 epidemic in the *Journal d'un Bourgeois de Paris*.—I am, etc.,

London, W.1, Aug. 21st. F. G. CROOKSHANK.

RESISTANCE TO TUBERCULOSIS.

SIR,—In your summarized report (April 2nd, p. 624) of a paper of mine on "Tuberculous lesions found in 800 Australian necropsies," read at the Australasian Medical Congress in Dunedin, New Zealand, in February, an error has crept in, owing to the line "No tuberculous foci detected" being mistaken for the words "Number of (No. of) tuberculous foci detected." The correct figures are as follows: In 800 records the results were: No tuberculous foci detected, 527 (66 per cent.); slight lesions present, possibly tuberculous, 43; tuberculous lesions present, 230 (28.7 per cent).

The account as printed reads: Number of tuberculous foci detected 527, instead of no tuberculous foci detected. If this remains uncorrected it may give a very erroneous idea of the prevalence of tuberculous lesions in Australia.—I am, etc.,

J. B. CLELAND.

Department of Pathology, The University of Adelaide, Adelaide, July 12th.

BRITISH DOCTORS IN MADEIRA.

SIR,—I practised in Portugal from 1920 to 1922, and during that time had only cordial relations with my Portuguese confreres. I therefore feel that it is for me to correct the biased evidence which has apparently been given before the General Medical Council by someone, acting on behalf of the British Embassy, who is either hopelessly incompetent to give this information or has made intentionally incorrect statements.

On looking up the regulations in the Year Book of the Faculty of Medicine of Oporto, published in 1920, I see that the fees payable on taking the examination for the degree of Doctor of Medicine amount to 300 escudos, not 3,000 as you state, equivalent to between £3 and £4, not £300 as you state. The escudo is at present worth 2½d.

Fees charged by English doctors are out of all proportion to those charged by Portuguese, and I can well understand the indignation of the latter, who have to work hard for a mere pittance, and who see English doctors practising in their midst among wealthy patients and making what to them appear to be fabulous incomes. These English doctors are, of course, looked upon as unqualified, and cannot give death certificates. Until I took my degree in 1922 in Oporto I, too, was unable to give death certificates, and had to get a Portuguese doctor to cover me.

If the General Medical Council wishes to legalize the position of English doctors in Madeira, the equitable way would be for the Council to seek reciprocity with the Portuguese Government in the matter of registering medical qualifications.—I am, etc.,

ST. GEORGE B. DELISLE GRAY, M.D.Oporto, M.B., B.S.Lond.

Hove, Aug. 22nd.

*** Dr. Delisle Gray will find the full text of the correspondence between the Privy Council and the General Medical Council in the minutes of the Executive Committee of the latter body of July 25th, 1927. The fee for the degree of Doctor is there given as escudos 3,000, but the error of stating this to be equivalent to £300 was ours.

Universities and Colleges.

SOCIETY OF APOTHECARIES OF LONDON.

The following candidates have passed in the subjects indicated:

SURGERY.—G. C. Rhys-Jones, E. H. Waller, J. L. M. Wood.

MEDICINE.—L. J. Lawrie, B. Rosenzvit, S. B. S. Smith, V. R. Smith.

FORENSIC MEDICINE.—K. E. Clarke, W. H. Collins, F. W. Crossley-Holland, T. C. Lansdale, J. Miller, V. R. Smith.

MIDWIFERY.—L. Ashkenza, T. M. Beattie, A. F. J. D'Arcy, J. Miller, N. S. J. Roberts, J. L. M. Wood.

The diploma of the Society has been granted to Messrs. L. Ashkenza, T. M. Beattie, W. H. Collins, T. C. Lansdale, L. J. Lawrie, S. B. S. Smith, E. H. Waller.

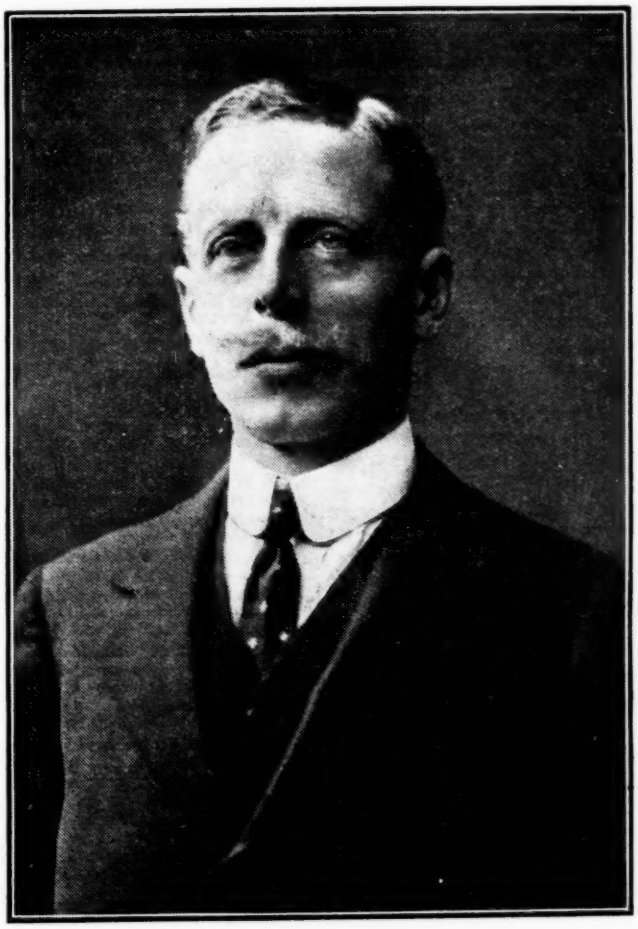
Obituary.

HARVEY LITTLEJOHN, M.B., C.M., B.Sc.ED., F.R.C.S., F.R.S.ED.,

Professor of Forensic Medicine in the University of Edinburgh.

WE announced last week with deep regret, which will be shared by all his old students, as well as by everyone who had the privilege of his acquaintance, the death of Professor Harvey Littlejohn. He had occupied the chair of forensic medicine in the University of Edinburgh since 1906.

We may well begin our short account of his life by quoting what has been written for us by the President of the Royal College of Physicians of Edinburgh, for few knew Littlejohn better than he or had ampler opportunities of appreciating his great qualities. Those who did not know him personally will find at a glance in the characteristic portrait here reproduced physical evidence of what Professor Robertson says with regard to Littlejohn's lively and energetic personality and his acute and penetrating intellect.



"The death of Professor Harvey Littlejohn creates a greater social gap in medical and academic circles in Edinburgh than would be caused by the loss of any other medical man, for his energetic, witty, and attractive personality made its presence felt in every company. His figure was slim, agile, and graceful; his intellect was alert and piercing; his disposition was human, sociable, and humorous; and with these qualities he combined soundness of judgement, feelings of responsibility, and a sense of justice. It is not surprising that he was asked to fill many important posts, for he was without doubt one of the greatest personalities in Edinburgh and one of its best and most useful citizens.

"He possessed the gift of eloquence, and was unsurpassed as a lecturer. Fortune seems to have lavished every qualification on him with a generous hand for this purpose. He possessed the knowledge and had acquired the experience which is a *sine qua non*; he had the faculty of presenting the dry facts of his subject in an attractive form; he was a born raconteur with dramatic talents of the highest order; he could illustrate his points liberally with apt and interesting reminiscences which held the attention of his audience, and, needless to say, the principles which he desired to drive home were never forgotten by his class, and the process of instruction was a pure joy. He shone at his brightest at the meetings of the Faculty of Medicine, and he was the greatest dean we have had in our lifetime. His breadth of view, his grasp of affairs, his clearness of exposition, his accuracy of judgement, and his lightning-like intuition were remarkable. No other member, no other half a dozen members, carried the same weight. The use he made of his wit, at one time to overcome fractious opposition, at another to smooth and obliterate ruffled feelings, was a delight to watch in operation.

"He took the deepest personal interest in the welfare of the medical students. When he discovered that anyone had been neglecting his work, the culprit had to appear before the dean and explain the reason why. This was an innovation and not popular with all, but Professor Littlejohn's high sense of duty would allow nothing to stand in its way. In the end he saw to it that all incorrigible "chronics" (amusing characters, many of them) were removed. He has not received full credit for this useful reform, for the class of student was a slur on the university and a source of contamination.

"Like his father before him, Professor Littlejohn was acknowledged to be one of our greatest experts in medical jurisprudence. He gave his evidence simply, clearly, and directly, and it was always impressive. With his forensic gifts he was a most dangerous man to cross-examine, if he chose to be. He, however, enjoyed a reputation in Parliament House (the Scottish Courts), which is one of the greatest tributes to his character, of being most moderate, just, and fair in his evidence on cross-examination.

"Professor Littlejohn was police surgeon and adviser to the Crown on all criminal matters. The secrets that reposed in his bosom may be imagined, and many of the problems on which his advice was asked must have been of a very serious nature, affecting reputation and life. It is certain that no more humane, more just or wiser counsellor could have been found. His father, Sir Henry Littlejohn, as medical officer of health for Edinburgh, made a reputation before him, of which he was very proud, but he has added to the laurels of the family."

This is a true picture and may help to explain the admiration with which he was regarded and the affection in which he was held.

Henry Harvey Littlejohn was born in 1862, and educated at the Edinburgh Academy and the University of Edinburgh. After taking the degree of M.A. he commenced the study of medicine, and graduated M.B., Ch.B. at Edinburgh in 1886. With the intention of following the specialty of which his father, the late Sir Henry Littlejohn, was a distinguished representative, he immediately proceeded to study public health, and graduated B.Sc. in that department in 1888. At this period also, shortly after graduation, he spent some time as resident physician at the Maternity Hospital under the late Sir Halliday Croom. After a period of study at the medical schools of Vienna, Berlin, and Paris, he took the L.R.C.S. in 1889, and proceeded in the following year to the Fellowship of the Royal College of Surgeons of Edinburgh. He had been also Senior President of the Royal Medical Society, in which he took a lifelong interest. At a later date he became a Fellow of the Royal Society of Edinburgh.

For some years after graduating in public health he acted as assistant to his father, Sir Henry Littlejohn, in the latter's class of medical jurisprudence, and at the same time helped him in the duties of the medical officer

of health for the city of Edinburgh. In 1891 he was himself appointed medical officer of health to the city of Sheffield, a post he held until 1897, when he returned to Edinburgh and commenced to lecture in medical jurisprudence at Surgeons' Hall, and at the Edinburgh School of Medicine for Women. He continued to act in these capacities until 1906, when he succeeded his father in the chair of medical jurisprudence in the University. At this time the University chair, which had hitherto embraced the two subjects of medical jurisprudence and public health, was divided by the appointment of a professor of public health. As a lecturer Littlejohn had a great gift for presenting the facts of his subject in a concise, lucid, and at the same time attractive form. The important points in his lectures were made to stand out by the striking manner in which he presented them, and by a great wealth of interesting reminiscence with which he was able to illustrate them; his lectures were not only interesting and amusing at the time of their delivery, but remained a permanent memory with his students.

In 1906, also, Harvey Littlejohn was appointed chief police surgeon in Edinburgh, and this brought him into association with the Crown authorities, so that he virtually succeeded Sir Henry Littlejohn as a frequent witness for the Crown in criminal cases in the High Court. Sir Henry Littlejohn had gained a great reputation as a medico-legal witness, and this was speedily equalled by his son. He was generally recognized as an expert witness who gave his evidence with great lucidity and conciseness, and at the same time was distinguished by his reasonableness and fairness under cross-examination.

Harvey Littlejohn was as clear, concise, and incisive a writer as a speaker, but he could not often be induced to contribute to current medical literature. He wrote an article on *post-mortem* examinations for medico-legal purposes in the *Quarterly Journal of Medicine*, 1902, and another on *post-mortem* appearances in the drowned in the *Edinburgh Medical Journal* in 1903; he contributed an article on medical jurisprudence to the *Encyclopaedia Medica*, and about two years ago published a book on *Forensic Medicine*, remarkable for the number of instructive illustrations it contained. He thus carried out the principle by which his teaching was always guided—that the subject must be taught objectively. In concluding our review we said of the volume that it was worthy of the distinguished author and the great school to which he belonged. He had inherited from his father a fine museum of forensic medicine, and had himself added to it many most interesting specimens; the collection is probably the most complete in Great Britain, and one of the finest in Europe.

Many addresses were delivered by him to the various societies of which he was a member; these included the Epidemiological Society, the Medico-Legal Society, the Society of Medical Officers of Health, and the Society for the Study of Inebriety. At the last International Medical Congress held in 1913 he was President of the Section of Forensic Medicine.

He was for many years a member of the British Medical Association and its very good friend, as also of its JOURNAL. Though friendly, he was a candid critic, and a conversation with him about the conduct of the JOURNAL was a tonic. He was secretary of the Section of Public Health when the Association met in Montreal in 1897, president of the Section of Public Health and Forensic Medicine in Sheffield in 1918, and for some years treasurer of the Edinburgh Branch; he had been elected president of the Section of Forensic Medicine at the Annual Meeting in Edinburgh this year, but owing to rapidly failing health was unable to take his place.

During part of the twenty-one years through which he held the chair of forensic medicine at Edinburgh University, Professor Littlejohn acted as dean of the Medical Faculty. He interpreted the duties of this post as carrying with them great responsibility in regard to the welfare of students, and, as Professor Robertson has said above, he did not shirk the duty of administering a fatherly admonition to students slack in their work and, if necessary, did not hesitate to remove from the University a number of "chronics" who exercised an unsatisfactory influence upon their younger fellow students. Professor Littlejohn was for several years a member of the Board of Managers of the Royal Infirmary. He was for a time Commandant of the Medical Unit of the Officers' Training Corps in the University, holding the rank of Major R.A.M.C.(T.). When, in 1915, the University of Edinburgh appointed him to be its representative on the General Medical Council, he quickly made his mark. He did not speak very often, but when he did what he had to say was to the point, and his influence with the Council was therefore very considerable. He was much interested in its work, and had served as a member of its Public Health Committee since 1916, and of its Education Committee since 1920. He was a diligent attendant, and always managed to fit in with the meetings of the Council the winter holiday he was in the habit of taking in the hope of mitigating the bronchitis and asthma to which he was a martyr.

Professor Littlejohn was very sociable and witty, and the vision of his alert and graceful figure in an Edinburgh street was always the prelude to an amusing and cheerful meeting with any friend he happened to encounter. His death will be a great loss both to the city and University of Edinburgh, as well as to the many organizations in which he took an active interest.

He was unmarried. The interment, subsequent to cremation, took place on August 19th, at the Dean Cemetery, and was attended by a large number of professional colleagues, including representatives from the town council, the University, the Royal College of Surgeons, and the Board of Management of the Royal Infirmary.

Dr. J. S. C. Haslam (assistant director, Bureau of Hygiene and Tropical Diseases, London) sends the following tribute:

Others are more able and more fitted than myself to pay tribute to Professor Littlejohn's renown as a medical jurist. Vast numbers of Edinburgh graduates will never forget his lecturing, with its dramatic power, originality of gesture, and characteristic mannerisms. Perhaps, too, many will remember him as dean of the Faculty of Medicine, dispensing counsel and correction to such as had deviated from the paths of academic rectitude. It was characteristic of Littlejohn that he hid his real kindliness behind a certain *brusqueric* of manner. As University assistant and as friend I had the privilege of getting behind what most students called his "pepperiness," and of knowing a side of the man little known to the great numbers who passed through his class. One August Bank Holiday three ragged children carrying a bottle of milk and a few buns were walking—a little wearily, for it was hot—along George IV Bridge. Professor Littlejohn stopped them, asked where they were going, and on being told "To Granton for a picnic," provided the tram fares for the party and a sixpence for further refreshments. The staff of the Edinburgh Children's Shelter could tell of many kindnesses to the little waif residents—of surreptitious pennies, and of tricks by Sam, the cocker spaniel. These are small things perhaps, but they illustrate the human side of Littlejohn which made him the friend and chief he was, a side which he seemed almost at pains to conceal, but which, to those who knew it, seemed the mainspring of his personality.

[The photograph reproduced is by Mr. A. Swan Watson, F.R.P.S., Edinburgh.]

Dr. T. P. GREENWOOD, who died suddenly on August 15th, while getting into his motor car in response to an urgent call, was born in November, 1853, and received his medical education at University College Hospital. He obtained the diplomas M.R.C.S.Eng. in 1875 and L.R.C.P.Ed. and L.M. in 1878. After holding the appointments of junior house-surgeon to the Derbyshire General Infirmary and house-surgeon to Stamford Infirmary, he became assistant, and later partner, to the late Dr. Roth in Stamford, and eventually succeeded him. He was senior surgeon to the Stamford Infirmary, surgeon to Browne's Hospital and Truesdale Hospital, Stamford, and medical officer of health to the Stamford Rural District, in which capacity he put in excellent work, especially in regard to housing, the provision of scavenging, and the building of a small-pox hospital. He was largely responsible for the erection and equipment of a maternity and children's ward at the Stamford Infirmary. He gave active support to the British Medical Association, and was vice-president of the Midland Branch in 1899, and president in 1903 and 1925. He was vice-chairman of the Kesteven Division in 1915 and 1923, and chairman in 1922; he was also an associate member of the Lincoln Division. He is survived by his widow and

three daughters. A colleague writes: Dr. Greenwood was one of the few survivors of the old type of general practitioner. His chief aim in life was his professional work, and he succeeded in building up a very large general practice in and around Stamford. His colleagues had a very high opinion of his skill, and he was often called in consultation with his professional brethren for miles around Stamford. His principal amusement was racing, and he scarcely ever missed seeing the Epsom classic; in fact, it was his one holiday in the year. He belonged to the Badminton Club. In politics he was a strong Conservative, and a vice-president of the Stamford and Rutland Conservative Association. His death has caused a great gap in the medical world of South Lincolnshire and Rutland which it will not be easy to fill.

Dr. HORACE CLULOW NIXON, who died on July 15th, at the age of 50, was born in Staffordshire, and received his medical education at Edinburgh, Dublin, and St. Bartholomew's Hospital. He graduated M.B., Ch.B.Ed. in 1900, and proceeded M.D. four years later. After holding the post of house-physician at the North Staffordshire Infirmary and Eye Hospital, and senior house-surgeon at Huddersfield Infirmary, he practised for some years in Harrogate. During the war he held a commission as temporary surgeon in the Royal Navy, and was later medical officer in charge of out-patients at Edmonton Military Hospital. After the war he became medical superintendent of the Ministry of Pensions Hospital at Harrogate; when it was closed he commenced practice in Bath, and held the appointments of physician to the Royal Mineral Water Hospital and medical officer in charge of the physiotherapy department of the Royal United Hospital. He was a member of the British Medical Association, of the Bath Clinical Society, of the Bristol Medico-Chirurgical Society, and of the Three Arts Club at Harrogate. He composed many songs and pianoforte music, which were published under the name of Horace Clulow.

DR. EDWARD COLBY SHARPIN, who died at his residence in Bedford on August 4th, was the eldest son of the late Mr. Henry Wilson Sharpin, F.R.C.S., and was born in Bedford in 1859. He received his medical education at St. Bartholomew's Hospital; he obtained the diploma of M.R.C.S.Eng. in 1882, and in the following year the L.R.C.P.Ed. and L.M. After holding the post of house-surgeon at the Lincoln County Hospital he joined his cousin in practice in Bedford, and was appointed surgeon and, later, consulting surgeon to the Bedford County Hospital, consulting surgeon to the Bedford Central Provident Dispensary, and senior physician and referee to the Royal Home for Incurables at Leamington. He was a member of the British Medical Association, and served on the South Midland Branch Council, 1896-7. Apart from his practice Dr. Sharpin took great interest in gardening; he exhibited successfully in many parts of England and won the Royal Botanic Society's silver medal for carnations and picotees. He was also a keen sportsman and a good shot. For some years he was a member of the Bedford Town Council.

THE following well known foreign medical men have recently died: Dr. HENRY KOPLIK of New York, aged 68, attending pediatrist to Mount Sinai Hospital, who discovered the buccal spots of measles, to which his name is attached; Dr. ABRAHAM ZINGHER, professor of clinical pediatrics at the New York Policlinic, who played a prominent part in immunization of children against diphtheria and scarlet fever, died from accidental asphyxiation in a laboratory, at the age of 43; Professor M. GROSSMANN, a Viennese otologist, aged 78; Professor GUSTAV FRITSCH of Berlin, who collaborated with Hitzig in the experimental physiology of the brain, aged 89; Professor P. KUBINY, a Budapest gynaecologist, of apoplexy during an operation, aged 57; Professor WERMEL, director of the physiatric institute at Moscow; Dr. VAUTRIN, professor of clinical surgery at the Nancy Faculty of Medicine; Dr. ROBERT PICQUÉ, professor of anatomy at the Bordeaux faculty of medicine and a pioneer in the surgery of aviation, aged 50, in an aeroplane accident; Dr. OTTONE BARBACCI, professor of morbid anatomy and director of the medical faculty at Sienna, aged 66; and Dr. ERASENO DE PAOLI, professor of Surgery at Perugia.

Medical News.

THE third revised report of the recommendations of the X-Ray and Radium Protection Committee has been issued by the National Physical Laboratory. Some slight alterations in detail have been made, but in the main the requirements for efficient protection remain unaltered. Although some may think the conditions onerous, and the protection overdone, it is at any rate wise to err on the side of safety, especially in view of the large number of *x*-ray and radium deaths and injuries. The danger of ultra-violet therapy and the precautions to be observed are also dealt with. No hospital authorities, medical or lay, can afford to overlook the advice contained in the report, and this applies not only to buildings and apparatus, but also to the suggestions as regards the working staff. Copies can be obtained on application to the Secretary, British Institute of Radiology, 32, Welbeck Street, London, W.1.

IN connexion with the meeting in December, at Cairo, of the congress entitled the Journées Médicales d'Egypte, of which a preliminary notice appeared in our issue of April 30th (p. 820), it is now stated that promises of support have been received from the University of Egypt and the Society of Egyptian Medicine. The arrangements, it was found, had gone too far to make it convenient to combine this congress with another proposed to be held late in 1928 in commemoration of the centenary of the Kasr-el-Aini Hospital in Cairo.

A SUM of £30,000 is required to repair damage by earthquake to the hospital of the Order of St. John at Jerusalem and to bring the accommodation and equipment up to present requirements. It may be recalled that reference to the extension of this hospital appeared in our issue of April 23rd, 1927 (p. 771).

THE Fellowship of Medicine announces that a fortnight's course will start on September 12th at the Queen's Hospital for Children, including lectures, operations, and demonstrations, and on the same date a three weeks' course will begin at the Royal Westminster Ophthalmic Hospital. For a fortnight from September 19th the Royal National Orthopaedic Hospital will hold a special all-day course, with lecture-demonstrations in the mornings and operations and out-patient work in the afternoons. During the same period there will be another all-day course in medicine, surgery, and the specialties at the Westminster Hospital. During October courses will be given in ante-natal treatment at the Royal Free Hospital; cardiology at the National Hospital for Diseases of the Heart; diseases of children at the Victoria Hospital and Paddington Green Hospital; diseases of the throat, nose, and ear at the Central London Throat, Nose, and Ear Hospital; electrotherapy at the Royal Free Hospital; gynaecology at the Chelsea Hospital; ophthalmology at the Royal Eye Hospital; tropical medicine at the London School of Hygiene and Tropical Medicine; and neurology at the National Hospital, Queen Square. The Fellowship of Medicine has also arranged a series of lectures on practical hints on medicine, surgery, and the allied specialties. The first of the series will be delivered on October 17th by Sir Humphry Rolleston, who will be followed on succeeding Mondays until Christmas by other physicians and by surgeons. There will also be a series of weekly clinical demonstrations in medicine, in surgery, and in ophthalmology given at various hospitals, free to medical practitioners. Copies of the syllabuses for all these courses may be obtained from the Secretary of the Fellowship, 1, Wimpole Street, W.1.

A. E. DEAN AND CO., Holborn, London, have issued a new catalogue of apparatus required for deep-seated radiation by means of *x* rays. Special attention is drawn to the "Isometric Group," two sets of which have been supplied to the General Infirmary, Leeds, and have stood the test of time. The catalogue is well illustrated and the letterpress gives good descriptions of the main and accessory apparatus. The part dealing with the different methods of measuring dosage should be useful.

THE German Paediatric Society will hold its thirty-eighth annual meeting at Budapest from September 11th to 15th, under the presidency of Professor Schlossmann of Düsseldorf.

DR. EMIL DE GRÓSZ of Budapest has published a sympathetic address on Lister and Semmelweis in the Hungarian journal *Otvosrépzés* for June 25th, illustrated with portraits and accompanied by an abstract in English.

Letters, Notes, and Answers.

All communications in regard to editorial business should be addressed to ***The EDITOR, British Medical Journal, British Medical Association House, Tavistock Square, W.C.1.***

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the BRITISH MEDICAL JOURNAL alone unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

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All communications with reference to ADVERTISEMENTS, as well as orders for copies of the JOURNAL, should be addressed to the Financial Secretary and Business Manager.

The ***TELEPHONE NUMBERS*** of the British Medical Association and the BRITISH MEDICAL JOURNAL are *MUSEUM 9861, 9862, 9863,* and *9864* (internal exchange, four lines).

The ***TELEGRAPHIC ADDRESSES*** are:

EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology Westcent, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*

MEDICAL SECRETARY, *Mediscera Westcent, London.*

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 4737 Dublin), and of the Scottish Office, 6, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 4361 Central).

QUERIES AND ANSWERS.

SMEGMA.

"S." wishes to know whether, after complete circumcision in infancy, the secretion of smegma is diminished or suppressed.

HYPERIDROSIS.

"TROPICUS," who writes from the West Coast of Africa, asks for advice in the treatment of hyperidrosis of the palms and soles in a man aged 35. He has suffered from boyhood, but the condition has grown worse during the last few years. While in the tropics, where he has spent most of the last five years, the condition disappears, but reappears as soon as he reaches a cold climate. Stout leather shoes are saturated in an hour, and the wearing of gloves is impossible; otherwise he enjoys good health. Various remedies, but not *x* rays, have been tried without success.

TREATMENT OF GONORRHOEA.

DR. P. C. P. INGRAM (Newport, Mon.) writes: Dr. R. Cock, in your issue of August 13th (p. 267), asks for opinions as to the treatment of gonorrhoea by injections of hydrogen peroxide. It does not appear to be much in favour. The only reference I can find is in Luys's *Gonorrhoea* (Foerster's translation, second edition, London, 1917), where it is mentioned last in a list of seventeen drugs that can be used. Harrison does not mention it in his book (Oxford Medical Publications, London, 1919) nor in his article on the routine treatment of gonorrhoea (*British Journal of Venereal Diseases*, vol. 2, p. 30), nor does Hoffmann (ibid., p. 233) or Jadassohn (ibid., vol. 3, p. 160) in accounts of their methods. I think he will find that the most generally accepted opinion is that irrigation with potassium permanganate by Janet's method is superior to any form of injection, and its continued use in almost all the venereal disease clinics in this country appears to show that it is standing the test of time. While it is agreed that the best method of cure is to "get the gonococci" early, more harm than good may be done by "treating them rough," as the delicate mucous membrane of the urethra may have to share in that method, with unsatisfactory results. Regarding the case he quotes, were any of the recognized tests for cure tried after the discharge had ceased?

INCOME TAX.

Subscriptions and Rent Proportion.

"M. M." inquires as to the admissibility of payments made in the form of subscription, and asks whether the circumstances stated do not justify the deduction of more than half the rent, rates, etc., paid in respect of the premises used for private and professional purposes.

*** Most of the refused "subscriptions" are really payments for professional literature reasonably necessary for the work carried on, and the claim should be put forward on that basis. With regard to the premises the amount of accommodation used professionally—including that occupied by the professional staff—is abnormal, and prima facie two-thirds would be reasonable. It is sometimes helpful to compare the personal accommodation with the *balance* of the rent, etc., cost to see what is reasonable from that point of view. There is no statutory maximum or minimum. "M. M." has a right of appeal to the District Commissioners or to the Special Commissioners, both bodies being, of course, quite independent of the revenue department in such matters.

Motor Car Allowances.

"L. B. S." elected to take wear-and-tear—that is, depreciation—allowance in respect of his car for 1926–27. The inspector of taxes has refused on that ground to grant any "replacement" or "obsolescence" allowance in respect of that car. The amount of the claim is £110 less (£65+£19)—that is, £26.

*** We suggest that "L. B. S." should refer the inspector to Rule 7 applying to Cases I and II, Schedule D, Income Tax Act, 1918, which, as amended by the Finance Act, 1925, provides that "in estimating the profits . . . there shall be allowed to be deducted . . . so much of any amount expended in that year in replacing any plant or machinery which has become obsolete as is equivalent to the cost of the plant or machinery replaced after deducting from that cost the total amount of any allowances . . . made . . . on account of the wear and tear of that plant and machinery and any sum realized by the sale of that machinery or plant." The authority of the Caledonian Railway case is against the simultaneous allowance of "cost of renewals" and depreciation, but does not affect the right to the obsolescence allowance, which appears clearly to be due to our correspondent under the above-quoted section.

Replacement of Car.

"INQUIRER" bought a 16-h.p. car in 1913 for £200; he has been allowed £77 for depreciation and will sell the car this year for £15. He has bought (also this year) a secondhand 18-h.p. car for £75. What allowance should he claim?

*** If "Inquirer" will refer to the reply to "L. B. S." printed above he will see the limitations under which an obsolescence claim can be made. In his case the result of deducting the depreciation allowances from the cost of replacing the old car is to reduce it to *nil*, and he can therefore claim nothing under that section. He might ask the inspector of taxes to continue to allow depreciation on the written-down value of the old car, less the £15 received—that is, on the £108; we understand that this is sometimes done in cases of hardship.

LETTERS, NOTES, ETC.

CLINICAL VARIATIONS IN DISEASE FROM THE HISTORICAL POINT OF VIEW.

DR. T. GERALD GARRY (Montecatini, Italy) writes: Sir Humphry Rolleston's instructive paper (JOURNAL, August 6th, p. 205) should be carefuly read and digested. I doubt very much, however, if much accurate information can be obtained concerning disease by the pathological study of Egyptian mummies. This was shown recently in the case of Tut-ankh-Amen. Nothing remains of the original but "skin and bones," well pickled; the same applies to the viscera, which undergoes various processes. About the existence of certain diseases—such, for instance, as aneurysm—there can be no doubt, but the existence of such conditions as, for example, arterio-sclerosis and rheumatoid arthritis (always a rare entity in Egypt) is questionable. From a study of the symptoms described in the papyri—a fairly reliable method, although there appears to be no unanimity concerning even the name of the heart—over two hundred different diseases can be differentiated, and, generally speaking, the incidence of such morbid conditions has not materially changed among the present inhabitants of Egypt. As in ancient times, diseases of the eye, skin, intestines, bladder, and urinary tract figure prominently. It is a pity that there should be so much exaggeration concerning the "wonderful knowledge" of medicine possessed by the ancient Egyptians. Authorities like Maspero and Reisner assert—rightly—that it was not worth considering. The basis of their pathology was not disturbance of normal function, but malign spirits, varying in virulence, which could only be met by ordering a prescription for "expelling or terrifying such a disease," caused by them.

CAUTION.

ON April 3rd, 1926 (p. 640), members receiving begging letters from a Mrs. E. M. Etheridge were advised that before giving assistance they should communicate with the Secretary of the Charity Organization Society, Denison House, 296, Vauxhall Bridge Road, S.W.1. From information recently received it appears that Mrs. Etheridge is continuing her appeals, but from an address different from that used last year.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 32, 33, 34, 35, and 38 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 35 and 37.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *124*.